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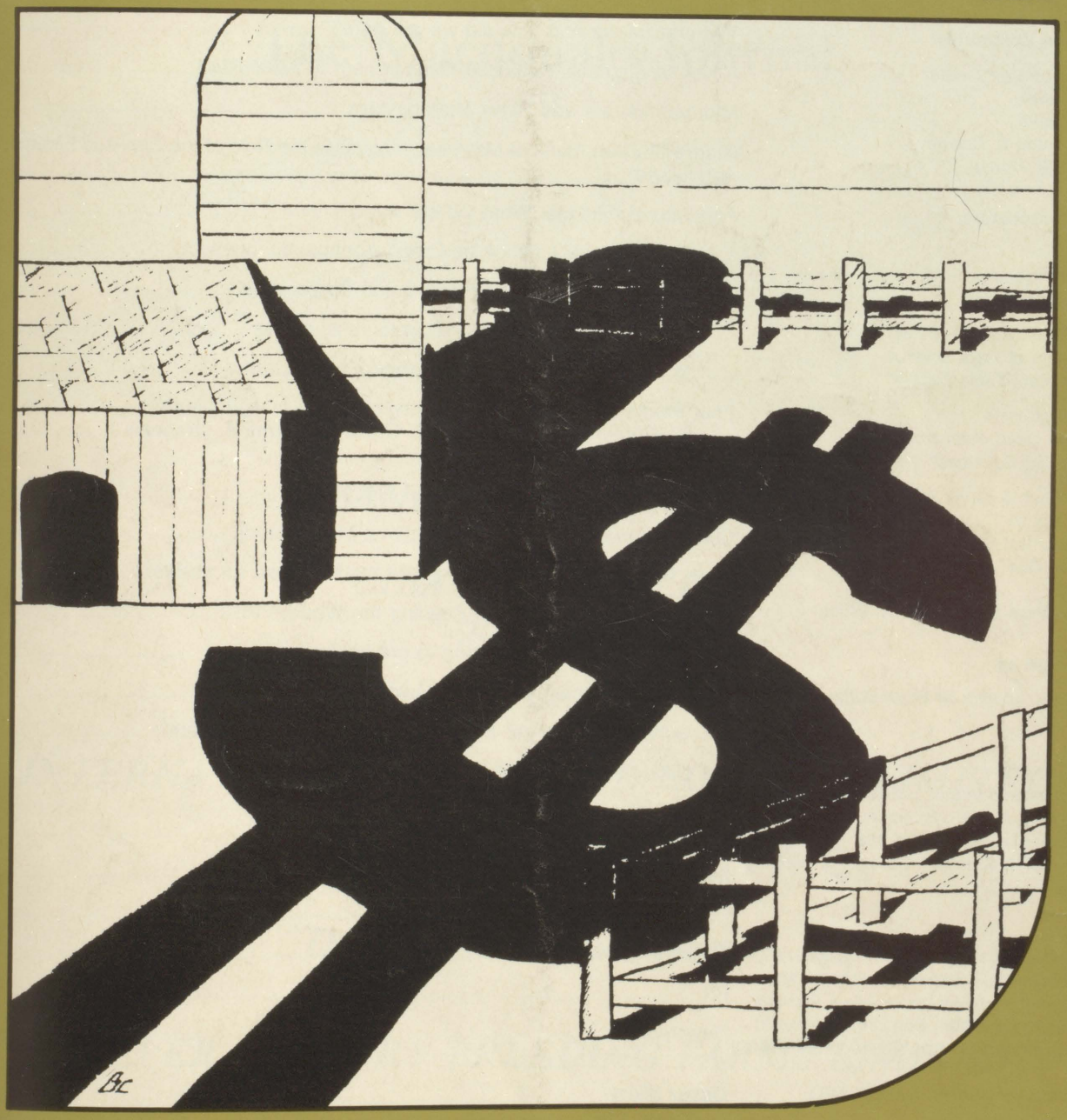

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Cover Story

Many farms across North America have been affected to some degree by the problems of heavy debts, high interest rates, declining asset values, and low incomes. These ingredients have combined to cast the shadow of a financial crisis on the farm scene as depicted in our cover design by high school student Brian Coffin. The financial crisis in agriculture is featured in this issue of the Journal with several articles by Macdonald staff and others involved in dealing with the problems of financing Quebec agriculture.

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Effective June 1, 1985, Dr. Roger Buckland, right, will be the new Dean of the Faculty of Agriculture and Vice-Principal (Macdonald College). He is seen here with, left, the present Dean, Dr. L.E. Lloyd, and former Dean of the Faculty of Education, Wayne Hall. The occasion was last fall's wine and cheese reception marking the 100th anniversary of women at McGill. Photo by Charles Fournier.

NEW DEAN AND VICE-PRINCIPAL

On April 16, 1985, the Board of Governors of McGill University announced the appointment of Professor Roger B. Buckland, currently Chairman of the Department of Animal Science, as Dean of the Faculty of Agriculture and Vice-Principal of McGill University (Macdonald College) effective June 1, 1985. This position became vacant because of the special early retirement of Dr. Lewis E. Lloyd. Dr. Lloyd will retire from the university on August 31, 1985, but is relinquishing his position as Dean and Vice-Principal as of June 1st. Dr. Lloyd will have completed three years of his second term, having come to Macdonald in 1977.

From Lower Jemseg, N.B., Professor Buckland obtained a Diploma from the Nova Scotia Agricultural College, followed by BSc (Agr) and MSc (Agr) degrees from McGill University. In 1968 he completed his PhD at the University of Maryland. Following a four-year period as a research scientist with Agriculture Canada in Agassiz, B.C., Dr. Buckland joined the staff in the Department of Animal Science in 1971. He has been Chairman of the department since 1979 and a full professor since 1980.

Dr. Buckland's research work on poultry fertility is supported by major grants from the Natural Sciences and Engineering Research Council of Canada, Agriculture Canada, and the Conseil des recherches et services agricoles du Québec and has resulted in numerous refereed publications.

Dr. Buckland has considerable international experience as well, as Canadian chairman of a joint Canada-Cuba poultry development group; as an advisor to Mexican and Venezuelan university poultry programs, and as a consultant to the Canadian International Development Agency (CIDA) on poultry development in Egypt.

Roger Buckland and his wife Vicki (Nealson), Dip Ed 63, have two children and have made their home in Hudson, Quebec, for the last several years.

The August issue of the *Macdonald Journal* will carry further information on the present and future deans.

THE FINANCIAL CRISIS IN AGRICULTURE

Where are we and how did we get here?

by L.B.B. Baker and H.G. Coffin
Department of Agricultural Economics

Traumatic scenes of foreclosure and forced sales of farm property have been occurring with increasing frequency across North America over the past few years. Media reports provide details of individual cases of hardship along with news about the increasing number of farm bankruptcies each year. The entertainment industry has even become involved with several movies dramatizing the struggle by farm families to retain their holdings. The Quebec government has been conducting a special inquiry into the situation of farm finance, partly in response to hunger strikes staged by several bankrupt farmers last year.

Most people are moved by the anguish and emotion involved in these cases. Those who argue that the problem is no worse in agriculture than in other types of business do not realize the extent to which farm families become attached to, and immersed in, their operation. For many, it is their *life* as well as their livelihood.

Given the nature of farming then, it is apparent that the failure of an operation, or even the stress associated with the *threat* of failure, cannot be measured by numbers alone. Nevertheless, in order to understand something of the scope and dimension of the problem, we must step back and try to interpret the various numerical measures available. This article attempts to provide that interpretation along with some explanation of how the industry finds itself in this position.

Measuring the Problem

Within our economic system we tend to think of official declarations of bankruptcy as appropriate indicators of business failure. Although there is no regular publication of bankruptcies in farming, data recorded by the Department of Consumer and Corporate Affairs in Ottawa are periodically reported by other sources. The most recent numbers for Quebec and Canada are shown in Table 1.

It is generally accepted that official bankruptcy data are not a very accurate measure of the extent of financial failure in agriculture. Forced sales or liquidations are a more common form of business failure, but no records are kept of such events. In the absence of such data, the growing number of farm bankruptcies suggests a trend towards a worsening situation in agriculture. But these data are of a historical nature and do not provide much insight into the nature of the problem or the farms currently in difficulty.

A comprehensive survey carried out by the Farm Credit Corporation in 1984 provides a great deal more information on the financial situation in agriculture than does any other single source. Moreover, since it corresponds to a previous survey by the same organization in 1981, it also reveals how the situation has changed in the past three years. Based on this survey, the financial situation in agriculture has, indeed, continued to deteriorate as equity has been eroded by declining land values, liabilities of farmers have increased, repayment of loans has been hampered by low farm incomes, and debt service charges have remained high due to *real* interest rate (i.e., the difference between the interest rates charged on loans and the rate of inflation) being well above traditional levels. Some of these changes are reflected in the balance sheet of the "average" Quebec and Canadian farms summarized in Table 2. For example, the decline in land values is partially revealed by the reduction in long-term assets. Increased borrowing by farmers shows up mainly in the short- and long-term liabilities.

But even these data do not reveal a serious financial problem in agriculture. For many people there is no financial crisis. Well-established farms that have been in operation for many

Table 1. Farm bankruptcies in Quebec and Canada

Year	Quebec	Canada	Quebec as % of Canada
	— Number of farms —		%
1979	14	125	11.2
1980	44	222	19.8
1981	54	261	20.7
1982	143	410	34.9
1983	125	488	25.6
1984	162	551	29.4

Source: Consumer and Corporate Affairs, Ottawa.

Table 2. Balance sheet of the average Quebec and Canadian farm, 1981 and 1984 (January)

	Quebec		Canada	
	1981	1984	1981	1984
	(thousands of dollars)			
Assets				
Short Term	30	33	64	61
Medium Term	114	128	118	130
Long Term	141	138	336	318
Totals[a]	285	299	519	508
Liabilities				
Short Term	6	10	13	15
Medium Term	13	14	18	20
Long Term	40	51	47	56
Totals[a]	58	75	78	91
Net Worth	227	224	441	418
Equity (%)	80%	75%	85%	82%

Source: Farm Credit Corporation Canada, *Farm Survey 1984*
[a]*Totals may not add due to rounding.*

years and are carrying relatively little debt may not be facing any immediate threat. The predominance of this type of enterprise makes industry-wide averages misleading. The financial crisis is found mostly in the farms with the lowest equity. This group includes many of the largest and most productive farms in the entire industry. Moreover, the operators of these farms are among the youngest. In Quebec, for example, the one third of farmers in the low-equity category had an average of 11 years of experience compared to nearly 19 for the industry as a whole.

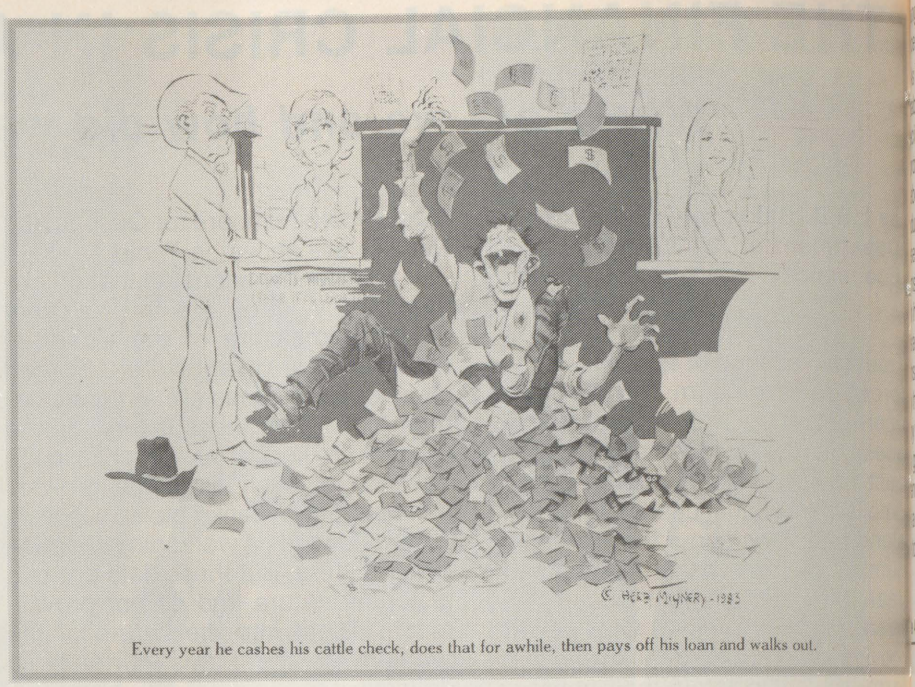
Other characteristics of this group of low-equity Quebec farms are summarized in Table 3, along with those of the one-third of farms with the highest equity. The one-third of all farms in the low equity group account for 41 per cent of the total farm assets and 54 per cent of total farm sales. With a sales/asset ratio of .335, the capital productivity of these farms is about 40 per cent higher than the average for the industry. But with average liabilities of $177 thousand per farm, interest charges alone are likely going to be $20-$25,000 per year. This would represent approximately one-fifth of total farm sales in these cases.

In contrast, the one-third of all farms included in the high-equity group represent only 25 per cent of total farm assets in Quebec and account for only one per cent of the liabilities and 16 per cent of farm sales. The sales/assets ratio of 0.158 for this group represents a capital turnover rate of less than half that of the low-equity group, suggesting a less productive use of capital apart from any appreciation in asset value. Operators of these farms tend to be older with an average of 27 years of experience in farming.

Farms in Trouble

Even with their high debt burden, not all farms in the low-equity group are in serious trouble. But it is estimated that about 7,500 farms are facing some degree of financial stress. The prospect for recovery depends upon the *nature* of the debt (proportion of short, medium and long term), the *policies and practices of governments and lenders* and the *type of farming enterprise.* In general, the low-equity group in Quebec have about the same debt-distribution as the average for the province (14 per cent short term, 17 per cent medium term, and 69 per cent long term) and are more heavily weighted toward long-term debt than the average Canadian farm. In this sense they may have some opportunities to recover if they can survive the short term.

Policies and programs of government, both federal and provincial, cover a broad range of activities, pertaining to farm credit and other aspects of farm costs and revenues. Of major importance here are credit and income stabilization policies. As one example on the credit side, loan guarantees and interest rate stability provide a certain measure of security to the borrower. For those farms holding long-term loans guaranteed by l'Office du Credit Agricole at subsidized interest rates, the threat of collapse may not be as great as appears on the surface. On the other hand, loans by private lenders, not secured in this fashion may be more subject to be called. This would reflect a change in lending practices as a result of the



Every year he cashes his cattle check, does that for awhile, then pays off his loan and walks out.

We are grateful to Herb Mignery and the Thos. D. Murhpy Co., Red Oak, Iowa, for permission to reprint the illustrations on these pages.

Table 3. Characteristics of low and high equity farms[a] in Quebec, 1984[b]

	Average low-equity farm	% of Quebec totals	Average high-equity farm	% of Quebec totals
	(thousands of dollars)	%	(thousands of dollars)	%
Assets	367.4	41	228.3	25
Liabilities	177.0	78	3.1	1
Net worth	190.4		225.2	
Average sales	123.0	54	36.2	16
Net off-farm income	6.7	34	6.6	33
Total revenue	129.7		42.8	
Sales/asset ratio	.335	140	.158	66
Equity (%)	52	69	99	132
No. of years as manager of surveyed farm	11	59	27	144
No. of farms	10,897	33	10,859	33

Source: Farm Credit Corporation Canada, *Farm Survey 1984*

[a]Low-equity farms are the one-third of total farms with the lowest equity, in this case averaging 52 per cent compared to the provincial average of 75 per cent. High-equity farms are the one-third of total farms with the highest equity, in this case averaging 99 per cent compared to the provincial average of 75 per cent.

[b]Balance sheet figures for January 1984, all other data for 1983.

changes in the economic environment since the 1970s.

As for the *type* of farming, there are notable differences among farms specialized in different product lines. A profile of the financial structure of Quebec farms specialized in major product lines is shown in Table 4. From these data it appears that most dairy farms surveyed are relatively healthy with high equity and asset values and average sales of $82,000. Cash crop farms, as a group, also appear reasonably healthy, comparing favourably in many respects with dairy farms. Within this group, however, it is likely that recent entries into cash grain production are in a more precarious position due to lower returns. There are more "part-time" farmers in cash crop production than in dairy production as evidenced by the average net off-farm income of $12,000.

The farms apparently in the most vulnerable position are those specialized in hog production. With average liabilities of $135 thousand and a total asset value of only $265 thousand, farmers in this group averaged only 49 per cent equity in their operation. In fact, in many ways, the financial structure of hog farms resembles that of the low-equity farms outlined in Table 3, except that they appear to be even more capital efficient as suggested by the sales/asset ratio of 0.445. In effect, this means that, as of 1983, it took only $2.25 worth of assets in hog farms to generate one dollar of sales, as compared to about $4.25 worth of assets in cash crop and dairy farms. This difference in capital intensity reflects the fact that many hog farms in Quebec have very little land associated with them. Whatever the reason for this difference, it suggests a higher debt repayment capacity in hogs than in other lines of production, provided that market returns are covering other costs of production. Hence, despite the difference in the liability position of hog producers, the debt-service charges may not be more burdensome relative to income than in dairy and cash crop farms.

The beef farms surveyed provide a notable departure from the others in that they could be vulnerable to financial stress despite the low liability and high equity position of these farms. This is essentially a cash flow problem with average sales of only $22,000 resulting in a very low sales/asset ratio. On this basis it took $7.82 worth of assets to generate one dollar of sales in beef production, suggesting a low debt repayment capacity. The relatively high off-farm income again suggests a high incidence of "part-time" operators in this business.

On balance, then, it is difficult to conclude which type of farming is in greatest difficulty. Hog and beef farms are certainly among the more vulnerable, and some have been among the casualties. But prospects for these operations could improve quickly with an increase in beef and hog prices.

There are other measures of financial stress in agriculture. The number of Farm Credit Corporation accounts in arrears as of September 1984 was reported as 14,203. This was an increase of 17.5 per cent from the previous year and accounted for nearly one-fifth of all FCC borrowers (Jones and Caldwell). The total credit outstanding in agriculture has continued to grow faster than income, totalling 13 per cent more in 1983 than total farm cash receipts for that year. An increase in interest rates, without at least a corresponding improvement in product prices, could result in serious problems for many farmers.

Table 4. Financial structure of Quebec farms by product type, 1984[a]

	Cash Crop	Dairy	Hog	Beef
		(thousands of dollars)		
Assets	277	348	265	172
Liabilities				
Short term	11	6	29	8
Medium term	17	15	23	7
Long term	50	58	84	16
Total	78	79	135	30
Net Worth	199	269	130	142
Average Sales	65	82	118	22
Net off-farm income	12	2	6	13
Sales/assets ratio	0.235	0.236	0.445	0.128
Equity (%)	72	77	49	82

Source: Farm Credit Corporation, *Farm Survey 1984*.
[a] Balance Sheet figures for January 1984; all other figures for 1983.

If it's such a good investment, why are ya sellin' it?

How Did We Get Here?

In searching for an explanation for the current financial situation in

agriculture there is often a tendency to try to identify a single culprit. Farmers tend to blame the government, governments blame the banks, and the banks blame the farmer. In reality the responsibility, to the extent it can be assigned, must be shared by all parties involved. To understand the role that each played we must back up in time to the mid-1970s. Farming at that time was reasonably prosperous, at least in the aggregate. But it was especially attractive to invest in farm land because of the rapid appreciation in values which was occurring at the time. With annual average increases in the order of 15 per cent and low (even negative) *real* interest rates, the purchase of farm land was more than a hedge against inflation — it was a very attractive investment.

People responded to the attractiveness by entering or expanding their farming operation. They were even encouraged to do so by government programs which subsidized interest rates at a time when they were already low, by today's standards, and by programs which provided start-up subsidies for certain lines of production.

The chartered banks, with large reserves of money to lend and with an eye on the apparent security of farm land as collateral, were also eager to expand their share of the agricultural credit market. They were competing aggressively for the farm business.

No one apparently foresaw the extent or the impact of the economic recession and the increase in interest rates which hit the industry in the 1980s. While soft product prices kept downward pressure on farm incomes, interest charges on farm debt more than doubled in the period 1978-81. The inevitable began to happen. Land values which had been inflated well beyond the level justified by returns in agriculture began to decline. Creditors became concerned about the erosion of their collateral and the security of their loans. Farm failures began to escalate to where they are today. We can look back now and say that farmers should not have borrowed so much money; that they should have foreseen the interest rate gyrations and depressed product prices. But we must also acknowledge that their expectations were fostered by government and bank lending programs which also did not foresee those developments.

Implications for Farmers

A numerical example is included here to illustrate the expectation of growth through borrowing, and the effect of borrowing if interest rates are higher than returns. This is done by examining the impact of different rates of return on farms with different debt structure.

As already mentioned, farm land values were increasing at about 15 per cent per year through the 1970s. If we add to this a small after-tax return based on production, we could have a situation where an annual return to total farm capital was of the order of 17 per cent per year. On the other hand, since 1980 land values have been falling and, coupled with poor production returns (actual losses for some farmers), an annual return to total capital of five per cent might not be unrealistic in the early 1980s.

The information in Table 5 illustrates the relationship between the amount of borrowed money used in a business and the growth (or decrease) in the farm's equity at an interest rate of 12.75 per cent. The four columns under the subheading **Debt/Equity Ratios** illustrate four possible farm situations today in Quebec. As explained in the footnotes to the Table, they go from a farm with no debt (D/E = 0) to a farm with more debt than equity (D/E = 1.04).

When the return to capital is equal to the interest rate (the middle row), then the return to equity is exactly equal to the return to capital. This is because the return to capital is a return to both debt and equity capital. Thus the return to the debt portion is offset by the interest charged on the debt, and the return to the equity portion is equal to the return to total capital.

If, however, the return to capital is *higher than* the interest rate, the farm business can grow faster using borrowed money than just relying on equity. This is the row in the Table associated with a 17 per cent return to capital. Consider the example shown in the box:

The return to equity in this example is the value appearing in the row for a 17 per cent return to capital and a D/E = 1.04 (Table 5). This can be inter-

Suppose a farm valued at $300,000 (Assets) has a D/E = 1.04,

$300,000 × 51% = $153,000 Debt
$300,000 × 49% = $147,000 Equity
$300,000 Assets

Suppose that the return to this farm is 17 per cent ($300,000 × 17% = $51,000). This return must be reduced by the interest on the debt portion of total assets. Assuming an interest rate of 12.75 per cent, this amount is:

$$\$153,000 \times 12.75\% = \$19,507.50$$

The return to equity is then found by $51,000 − $19,507.50 = $31,492.50. As a percentage return to equity this is

$$\frac{\$31,492.50}{\$147,000} \times 100 = 21.4\%$$

Table 5. The effect of borrowed money on equity with alternate rates of return to farm capital*

% Return to Total Capital	Debt/equity ratios			
	0[a]	0.33[b]	0.92[c]	1.04[d]
	% Return to Equity			
17	17	18.5	21.0	21.4
12.75	12.8	12.8	12.8	12.8
5	5	2.5	−2.1	−3.1

*Assuming an interest rate of 12.75 per cent and reinvestment in the business.
[a]Representing a farm with no debt.
[b]25% debt and 75% equity similar to average Quebec farm in 1984 (see Table 2).
[c]48% debt and 52% equity similar to average low-equity farm in Quebec in 1984 (see Table 3).
[d]51% debt and 49% equity similar to average hog farm in Quebec in 1984 (see Table 4).

preted as showing a farm where the equity could be doubled in just under five years *with* borrowed money, but it would take almost six years to achieve this with no debts. This is the principle of *leverage* where we can lever up a firm with borrowed money.

Unfortunately, the opposite relationship is true when the return to capital is *less than* the interest rate. In this case the return to equity is lower for a farm with borrowed mony than for a farm with no debt. This situation becomes very severe when the return to capital is low. This is the bottom row of Table 5 and shows that for a farm with no debt (D/E = 0), the return to equity is equal to the return to total capital at five percent.

If we consider a farm with more debt than equity (D/E = 1.04), a return to capital of five per cent translates into a return to equity of −3.1 per cent, given an interest rate of 12.75 per cent. Another way of looking at this is that the equity in this farm would be eroded away rather than added to if conditions were to continue. This illustrates the principle of *increasing risk* where borrowed money puts a business at risk as the interest rate rises higher than the return to farm capital, and the risk increases with the amount of borrowed money.

How does this relate to the current situation? During the 1970s there were high rates of return to farming (including land) with relatively low interest rates. During those years the concept of leverage worked to the advantage of farmers and investors alike. Towards the end of the 1970s the interest rates rose and farm land values slowed in their yearly increases. Also, farm incomes decreased which reduced farmer's ability to repay the borrowed money. Now, in the 1980s, we are seeing negative returns, which reduce security levels. Farmers who locked in their loans at high rates are seeing their equity being eroded at frightening rates. Bankruptcy is the only outcome for some of these farms.

Conclusions

By most measures, the financial crisis facing Canadian agriculture may be called severe. Although many farms are not seriously affected by these conditions, it is estimated that about one-quarter to one-third of Canadian farms are facing some degree of financial stress. In Quebec the number in this category is estimated to be about 7,500 farms, including many of the younger and more productive farmers.

This situation has resulted from a combination of factors and circumstances. In the late 1970s heavy farm borrowing was encouraged by rapidly rising land values, high inflation, low interest rates, strong markets for agricultural products, government credit and other incentive programs, and aggressive lending policies of the banks interested in expanding their market shares. A reversal of many of these conditions in the 1980s has turned debt financing from a prudent management decision to a high risk strategy. Declining land values, low inflation, high interest rates, weak markets, tight government budgets, and nervous bankers have left many farmers in an untenable position.

Recognition of the *causes* of the crises is fundamental to finding solutions and preventive measures. To the extent that the responsibility for the current situation is shared by all participants, each must be expected to contribute to the solution. Some of these possibilities are dealt with in the articles which follow.

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ADULT EDUCATION:

An International Perspective

The Quebec Association for Adult Learning is sponsoring a landmark conference from June 12 to 15, 1985, to celebrate the 50th Anniversary of the Canadian Association for Adult Education at its founding site, Macdonald College. Providers and receivers of adult learning are invited to join with Quebec, Canadian, and world leaders in Adult Education to discuss three of the major issues of our time; basic education, work skill development, and empowerment.

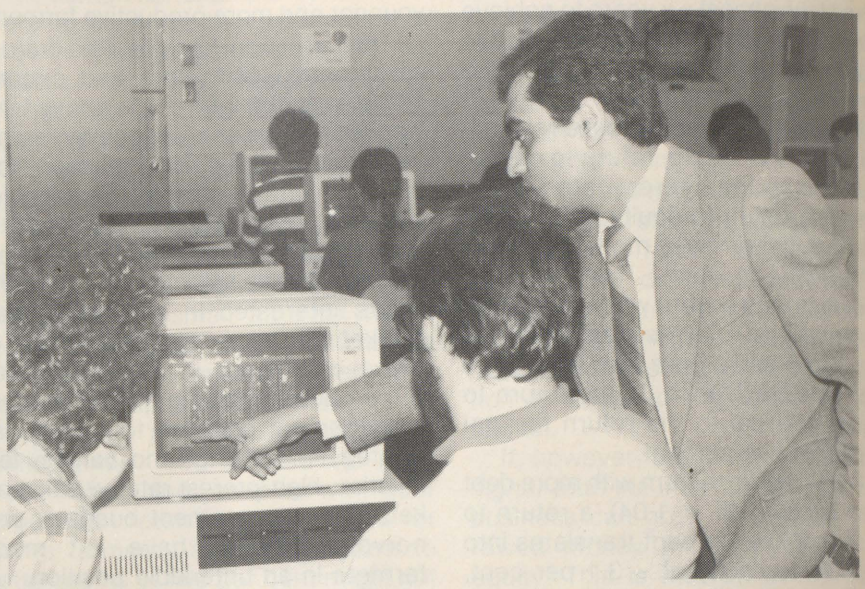
The first day of the conference will provide a world view on the three subthemes of the conference and thereby set the context for participants to address these issues as Canadians and Quebecers. Keynote addresses, panel sessions, and small workshops will offer ample opportunities to exchange ideas. Invited guest speakers include: Dame Nita Barrow, President of the International Council for Adult Education, Budd Hall, Secretary General, International Council for Adult Education, Stephen Lewis, Canadian Ambassador to the United Nations, and Anne Ironside, President of the Canadian Association for Adult Education.

It is hoped that this conference will open a window to the world of adult education. It will enable Canadians to see where we fit in international development, what we can offer, and what we can learn.

The working language of the conference will be English, and plans are being made for simultaneous translation. For further information on workshops, panel discussions, accommodation, fees, and so on, please write to the Extension Service, Box 284, Macdonald College, Que., H9X 1C0 or telephone (514) 457-2000, local 384.

Financial Management in Agriculture

by Professor K. Gunjal
Department of Agricultural Economics



Agricultural Economics students Denis Bussiers and Robert Malouin being instructed in the Agricultural Finances class by Professor Kisan Gunjal in the microcomputer laboratory.

It is often said that an efficient *production* operation is vital to a farmer's profitability. However, one should also realize that an efficient *financial* operation is vital to a farmer's survivability. For a successful farm business the producer has to be a good production manager, i.e., getting the best feed efficiency, making the best use of available land, using the most appropriate cultivation practice, and so on. As well, in today's economic world he/she has to be an even better financial manager.

The influence of financial factors is much more significant today than the influence of production factors. For example, a two per cent change in the interest rate on a $500,000 loan can mean savings or extra costs of $10,000 per year for several years into the future. Or a 10 per cent decline/increase in land values can erode/build equity by $50,000 for a farm worth half a million dollars. On the other hand, production efficiency changes, such as an increase in milk production per cow per year by 10 litres, will increase the gross income by about $440 for a milking herd of about 100 cows. It is not difficult to realize that production management is necessary but not enough for the survival of a farm business with today's economic conditions.

The financial structure of farms in Canada has changed dramatically over the years. Farms have been financed more through borrowed funds, hence they have become more debt-ridden. The total debt outstanding has increased from $4.4 billion in 1970 to $21.1 billion in 1983. The low equity farms which are in the most financial trouble today have been the heaviest borrowers. Increasing interest rates have made the problem worse. Figure 1 shows the ratio of total interest payments to net farm income before-interest-payment for Quebec and Canada for 1966-83 period. This ratio measures how much of every dollar of net income goes to service charges on the farm debt. In aggregate for Canada, less than 10 cents out of every dollar of net farm income went to pay for the debt load in 1966, while close to 40 cents out of every dollar went to pay for the farm debt burden in 1983. For Quebec farms this ratio has also increased but at a slightly lower pace, partly due to the credit subsidy programs. The trends are even clearer for the 1973-83 period indicating nearly a fourfold increase in the share of interest costs in the net farm income. This phenomenon underlines the increased importance of some of the financial factors in today's agriculture.

The traumatic plight of some bankrupt farms and severe financial difficulties of many others have been well demonstrated in the media over the past few months. This has raised concern and prompted a broad search for possible solutions to get out of this situation. It must be acknowledged first of all that farm operations are businesses and some businesses do fail.

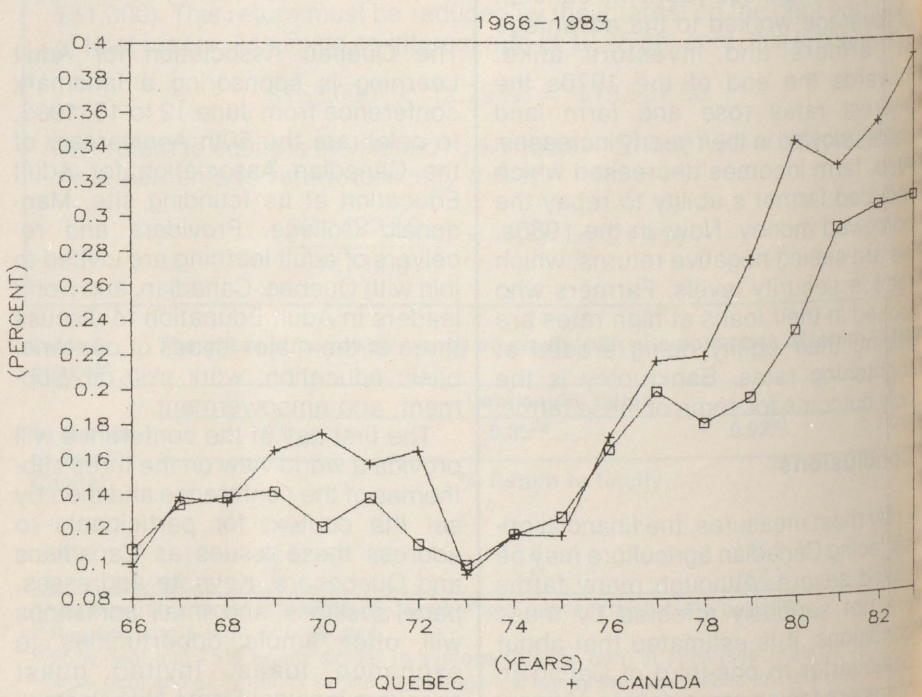


Figure 1. Interest cost/net farm income. Source: Agriculture Canada.

Another point to note is that when a non farm business folds and the market conditions are not favourable, others usually do not take over and resume the production thereby adding to the aggregate supply. However, when a farm goes under, someone else usually takes over the resources and resumes production. So, unfortunately, agriculture, due to its nature, does not gain the usual benefits of business failures. Historically, of course, farm failure rates have been quite low compared to those of other businesses. However, the rate of farm failures has been increasing. This should be a signal to producers to be alert to opportunities to improve their financial management.

Obviously there are no quick and easy remedial measures for many of the farms in trouble. Some of the solutions at the farm level lie in continuous and long-term efficient organization and planning, i.e., good financial management. Financial management is a continuous process of collecting and analysing financial information about the farm business and making prudent decisions with the help of this information. It involves keeping farm records, preparing financial statements, completing analysis steps, including long-term investment opportunities, and taking action. Some of these are discussed below.

Farm Records

Keeping records of daily business transactions is a first step towards better management. Most businesses need this information for tax and other purposes anyway. Single-entry and double-entry accounts are the two choices available. However, a large number of the record forms advised by extension services are of the single-entry type (Hopkins and Heady). Keeping good records may mean recording transactions systematically, regularly, and accurately.

The information contained in most record systems is usually voluminous and messy. In order to make sense out of it, it is necessary to summarize it in a standard specified format called a statement. The commonly used statements are a balance sheet, income statement, cash flow statement, and proforma cash flow statement.

Traditionally, the farming sector as a whole has not made much use of these statements. However, with today's financial environment farm managers cannot afford to ignore this fundamental step of management. The average farm in Quebec today controls total assets close to $300,000.

For lack of survey data it is difficult to say how many of the farms in Quebec prepare and use the basic financial statements. But a survey of commercial producers (200 acres and over) in Illinois in 1979 indicated that only 68 per cent used a balance sheet, 47 per cent used a proforma cash flow statement, and only 39 per cent used both (Garcia, Sonka and Mazzacco). In Great Britain all businesses have a legal obligation to keep accounts of which the balance sheet and profit-loss statement are central features. It is normal practice to have these accounts verified/prepared by an accountant (Warren). This kind of practice encourages farmers to keep good records, prepared statements and over all make decisions with a better information base.

Producers should be aware of the differences between the *accrual* versus *cash* method of accounting. Our tax laws allow producers to calculate income on a cash basis. This could be seen as an advantage to a business as one could shift cash payments around to minimize taxes in a given year. However, if the producer depends solely on this statement, he/she may have an erroneous picture of the year-to-year farm performance. To get an accurate picture one must have an income statement based on the *accrual* method, reflecting the actual market *value* of output produced, and actual cost of inputs used during that year as opposed to the *cash* received and *cash* paid. This statement would help to find the true profitability during a given year.

Perhaps the most important statement is a proforma or projected cash flow statement. This of course is based on future information. Some skills and a great deal of experience is required to generate this statement. Even a crude form of it may help tremendously to design a loan application and repayment schedule to minimize interest expenses. It may also help, to some extent, to avoid potential cash flow problems.

Serious financial difficulty is like a major disease and like most diseases it has certain symptoms. Some of these may even be early warning symptoms. Hence, diagnosis, particularly early diagnosis, may be vital to the financial health of a farm business. Diagnostic tools may include certain quantitative measures prepared from the financial statements.

Ratio analysis is one such technique that is widely accepted. It includes calculating and interpreting the values (and changes in these values over time) of key business indicators (ratios) that measure financial strength in terms of liquidity, solvency, profitability, and efficiency. Liquidity ratios (e.g., current ratio) can be very helpful in spotting the potential cash flow problems as they measure the repaying ability relative to the obligations in the immediate future.

The current ratio for Quebec agriculture has increased from 2.84 in 1981 to 3.30 in 1984 (based on the Farm Credit Corporation survey, 1984). This is perhaps an indication that, at least in the aggregate, farmers have improved their short-term repaying ability proportionately more than their short-term obligations. This seems to be an adjustment to the high interest shock of 1981. Serious liquidity problems may have to be solved by *asset restructuring* (converting long-term assets into more liquid assets) and/or *debt restructuring* (converting short-term obligations into long-term loans by refinancing).

Other important ratios include debt to asset ratio, return to equity, and sales to asset ratio measuring solvency, profitability and efficiency respectively. Each of these can be used to evaluate your farm operation relative to the industry norms. Unfortunately, it is extremely difficult to decide on what is the industry norm for agriculture. In Table 1 values of some of the selected ratios are calculated using 1983 sales and net income figures and January 1984 asset, debt, and equity figures for Quebec and Canada aggregate agriculture sector. These give a *very rough* idea about the short-term performance of the agriculture sector. For proper comparison one should have these standards established for each enterprise and each region over several years.

Many people believe that bigger and more efficient machinery always reduces per unit production costs for any farm operation. But this is not always true. In fact, for many farms it

may *increase* the average costs. One has to take a careful look at the size of the operation and the need for a particular machine. There are many farms with excess machinery capacity.

To make economically prudent investments one has to perform a long-term analysis of costs and potential benefits. Unfortunately, this analysis requires rather advanced skills and experience as it involves converting future annual benefits into present value and also the calculation of net present value, etc. A careful analysis may reveal that certain capital purchases under given conditions are not profitable. With a careful investment analysis one can see if incentives such as interest free loans for five years, interest rate subsidies, certain grants or tax shelters are sufficiently large to commit your own resources on a profitable basis.

Continual financial management aims mostly at *preventive* measures. Many factors are beyond the individual producer's control and may have unfavourable influences that cannot be avoided. However, at the farm level, good training in financial management practices may help to soften the blows of unforeseen and unexpected developments. Detail analysis may help to pinpoint the areas of vulnerability and foresee the extent of risks involved and help solve the problems before they become major business obstacles. Curative measures for severe distress problems, on the other hand, may involve crisis management which may differ from situation to situation.

Table 1. "Financial Barometer" for average Quebec and Canada farms[a]

Condition	Selected Ratio[b]	Quebec	Canada	Your Farm
Liquidity	Current Asset/ Current Liabilities	3.30	4.60	
Solvency	Debt/Equity	0.34	0.22	
Profitability	Net Income/Equity	0.078	0.031	
Efficiency	Sales/Assets	0.25	0.18	

[a]Calculations are based on the data from Farm Credit Corporation's 1984 Survey and the Handbook of Selected Agricultural Statistics, 1984, by Agriculture Canada.
[b]These are some of the selected ratios. There are several other useful ratios. The values of these are shown for the aggregate agriculture sector. The norms usually depend on several factors such as the type of agriculture, production region, government policies, general economic conditions, etc.

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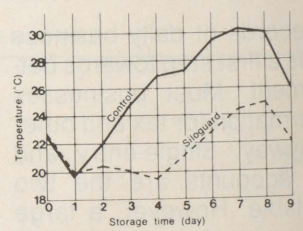

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Microcomputers and Farm Management

by Serge Bastien, Graduate Student Department of Agricultural Economics

Sales of microcomputers have boomed in the 1980s. Almost everyone is aware of the existence of these machines. From home entertainment to business operations, microcomputers have entered almost every facet of our daily lives. Microcomputers for some of us are revolutionizing the ways of performing the simplest tasks such as typing to the more complex and time consuming ones such as bookkeeping and performance analysis of a business.

The farming sector is capital intensive with a low profit margin. The potential for risky investment is high and a bad decision can mean trouble. There is a need for tools that will enhance management decisions. Timely and fast decisions are important in today's agriculture, and microcomputers can contribute a great deal towards fulfilling that need.

How can a microcomputer help you? First of all, a farmer needs information on which he can base his management decisions. The producer should have a record keeping system for accounts payable and receivable, quantities ordered and delivered, hours worked, etc. A computer would not relieve the producer of these tasks; but the handling, processing, and sorting of the information into meaningful tables and financial statements could be executed a lot faster than it could be done by hand. Moreover, since it is the computer that handles all the processing, cash flows projections and other forms of planning could be done more frequently. Up-to-date information would keep the farmer abreast of the financial situation of his farm operation.

A microcomputer requires software, which is the non physical portion of the computer, consisting of programs that make the computer perform specific tasks. This software comes in many forms but from the financial management point of view three categories are worth noting.

1) **All purpose electronic spreadsheets** such as Lotus 1-2-3, Visicalc, Multiplan, etc., transform the computer screen into a worksheet which replaces the pencil-and-calculator method of planning. The information is entered into the worksheet on the computer screen and if you make a mistake or change your mind about an entry, the spreadsheet program automatically recalculates all the entries that are linked to this one. An electronic spreadsheet is ideal for planning and analysis; however, it is not very easy to use and may require substantial training on the part of the user to become familiar with its operation.

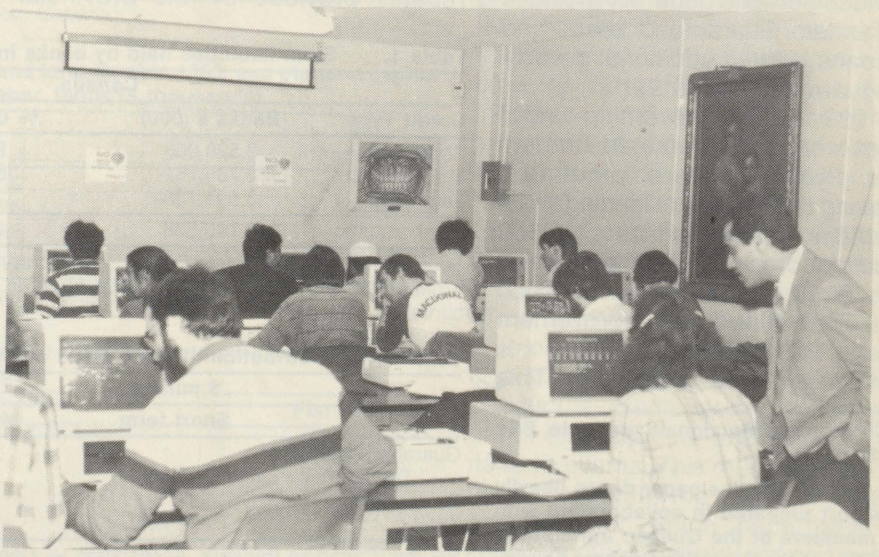
2) **Accounting software packages and templates** are less flexible than electronic spreadsheets but are more efficient at specific tasks such as checking journal entries, balancing entries, keeping an audit trail, etc. These are relatively easy to use and, in order to minimize the time spent on learning, appropriate templates have been designed by experts to be used with a commercial package, such as Lotus 1-2-3. For example, a balance sheet template would require from its user only the entry of his own data. The framework and the formulas are provided for the user. It is a good practice to have an accounting package to organize the books and also an electronic spreadsheet that uses the accounting figures for your projections and planning.

3) **Communication and electronic software** is also becoming increasingly popular. A microcomputer equipped with a modem (modulator/demodulator), a device that allows one to communicate through the telephone line, and allows one to have access to the information banks especially designed for farmers. Some of these data banks are Grassroots Canada, Agritex, and Mediagro (Quebec). These provide information on weather conditions, fulures markets, and specific aspects of crop and animal husbandry.

Microcomputers can be useful for management in farming; however, their use requires some adaptation on the part of the user. Their use might be frustrating in the beginning, but it should payoff in the long run. A wide variety of books which treat the subject of microcomputing in agriculture are also available.

The above information might leave the impression that the only use for microcomputers on the farm is for office and general accounting functions. There are many more uses to which computers can be applied, such as preparing least cost rations, keeping track of breeding and calving dates, genetic improvement, automation of feeding systems, etc.

Mechanization of farming has been taking place over recent decades. Perhaps now a new revolution is coming through the computerization of farming operations.



Microcomputers are playing an ever increasing role in education and in farm management.

The Role of Banks in Financing Agriculture

by Isidore Charron*
Director, Agricultural Services
Eastern Sector, Bank of Montreal**

The Canadian banking industry is the main provider of credit from private sources to agriculture in Canada, accounting for some 40 per cent of total farm credit (see Table 1). This is a recent development. At one time, banks were limited to offering short-term or guaranteed loans within the framework of the *Canada Farm Investment Loans Act* or provincial acts such as the *Quebec Farm Improvement Act.* In the last 15 years, following the 1967 review of the *Bank Act,* banks were allowed to provide medium- and long-term farm credit.

The introduction of the Tandem Guaranteed Loans Programs together with the Quebec Farm Credit Bureau's withdrawal from the field of direct farm credit have enabled the banks and their competitors to extend their lending in the fields of medium- and long-term farm credit to the Quebec market. This development in the Quebec farm credit market happened later than in the rest of Canada, occurring mainly from 1978 to 1981. Information provided by the major banks shows that the banks' total portfolio in Quebec agriculture is $935 millions, not including personal loans to farmers. Experience shows that a Quebec farmer's loan portfolio generally includes both Tandem Guaranteed Loans and bank loans *without* additional government guarantee (Table 2).

In 1983 the Acts governing two of the Government Guaranteed Tandem Loans Program were amended, increasing the maximum lending limits for cattle and grain producers to $500 thousand compared to the general limit of $100 thousand for production credit. The limit for farm improvement loans for all types of farms under this program is $200 thousand. This increase does not appear to have had a noticeable effect on producers served by banks since there were few who requested this increase.

The banks, in order to better serve the Quebec farm market, have staffed themselves with specialists in agriculture. At present there are 21 agrologists and eight agrotechnicians employed by the banks in Quebec as well as 150 branch managers who spend most of their time dealing with agriculture. Some 182 bank branches now manage a farm loan portfolio of more than $1 million. Given their specialized personnel and the number of branches serving agriculture, it can be said that "la banque agricole" exists in the form of this network of commercial bankers. In addition to its lending activities "la banque agricole" also offers Quebec farmers numerous ancillary services enabling them to achieve a healthier management of their respective businesses.

The farm credit portfolio of the banking industry in Canada is $8.7 billion. Of this total, some $935 million are invested in Quebec agriculture. A large percentage of medium- and long-term farm credit extended by banks is classified within the Government Guaranteed Tandem Loans Programs in effect since 1978. These programs gave rise to a strong response by Quebec farmers due to the interest rate rebates provided by the provincial government.

According to the definition of farms in the *1984 Farm Survey* of the Farm Credit Corporation (e.g., an undertaking selling more than $5,000 worth of products annually), there would be more than 32,000 farms in Quebec. Of this number, less than one-third (10,228) contributed 71 per cent of all sales of farm products while another 34.3 per cent of producers accounted for only 5.5 per cent of total sales (Table 3). Such a wide distribution in sales among "farm producers" tends to confirm that for "low income" producers the main objective is not the production of goods for sale since that source contributes less than the off-farm income for this category of farms. Farmers with higher farm sales have also invested more and were *planning* to invest more than those with lower sales as shown in Table 4.

By type of production, dairy farms with a well-structured quota system at the producers level have created more investments due, in part, to income stability generated by this production and the confidence of producers in the dairy industry. Producers of commodities facing unstable markets (such as pork or cash crops) have tended to limit their investments. This is at least partly due to unstable prices and unfavourable economic conditions for these products which limit profitability and purchasing power of these

Table 1. Farm liabilities held by banks in Quebec and Canada

	Canada		Quebec[a]	
Credit Type	**Banks $ (000)**	**% of total**	**Banks $ (000)**	**% of total**
Short-term	2,528,008	73.8	125,161	39.9
Medium-term	2,709,762	60.2	173,596	36.9
Long-term	3,507,738	27.4	425,414	25.4
Total	8,745,508	42%	724,171	29%

Source: 1984 Farm Survey, Farm Credit Corporation, Canada
[a]These data differ slightly from those found in Table 2 due to sampling variations in different surveys.

Table 2. Distribution of guaranteed and bank credit in Quebec agriculture

	$ million			
	Short term	**Medium term**	**Long term**	**Total**
Guaranteed Loans "Tandem"	36,684	111,063	415,047	568,794
Bank Loans*	263,1	43,6	57,791	366,491
Total	299,784	153,663	472,838	935,285

Source: Canadian Bankers' Association — Quebec Committee — February 1985
*Personal loans to farmers are not included.

***Mr. Charron is a Macdonald graduate, BSc (Agr) '80**

****The first part of this paper draws heavily on a report prepared in collaboration with other members of the Quebec Agricultural Committee of the Canadian Bankers Association.**

roducers at the present time. Of ourse, the data in Table 5 also reflect ifferences in the number of farms in ach category.

Investments during the last few ears by farmers producing the most nd having the highest gross farm ales have expanded too rapidly. On he whole, it is these producers who re the most in debt and some of them ave to carry a heavy repayment urden.

In the light of the above information, oday's farmers must be very efficient nd very good managers. In the past, *ome* producers have seen their finan- ial situation deteriorate for the follow- g reasons:

) Not abiding by investment priorities, in general;
) Financing often exceeding the eco- nomic duration of acquired goods;
) Heavy capital asset purchasing to the detriment of the working capital;
) Willing to expand very rapidly.

All these factors, combined with eak administrative capabilities and ifficult economic circumstances of ertain types of production, have con- ributed to accentuate the precarious ituation of some farmers.

Financing of a farm business is now equiring a greater effort from both farmers and lenders. Reduced margins, inflation, and high interest rates emphasize the importance for a farmer to be a good manager. This begins with the loan application. Historically, a credit application was evaluated on the basis of a financial statement prepared by hand with guarantees offered. Now, credit financing of farmers is becoming much more complex, mainly because of total indebtedness of farm and other factors inherent to this type of business, such as operating expense, uncertain markets, weather and disease problems. Therefore, it is becoming very important to obtain all the information required to make a thorough analysis of the loan application. The farmer should be in a position to provide a financial statement including the profit and loss statement, current operating results as well as a cash flow statement.

During a farm loan application study, the following criteria should be analysed:

- Repayment capacity;
- Financial position;
- Farmer's administrative capacity;
- Farmer's experience in the type of farm operation;
- Resources and operation facilities;
- Margin on credit operations;
- Guarantees.

It is a good thing that awareness is gradually developing in order to gear further education of our future farmers towards financial efficiency and more appropriate type of transfers.

Considering this era of deregulation where efficiency, profitability, and management skills become the most important factors ensuring the survival of farm business, the present involvement of the banking sector should be a true reflection of the will to serve the farm sector.

Being financial intermediaries and the managers of the savings (deposits) of our fellow citizens, the Canadian banking industry is bound to give preference to farmers whose businesses are profitable and well managed. In recent years, the concept of profitability in agriculture has gone through a remarkable change. This change is not without its headaches, not only to some farmers but to their bankers as well. During the second half of the 1970s inflation created an artificial surge of land values; this favored capital investments in agriculture irrespective of the actual farm income being generated by the unit. This inflation hid the fact that the aggregate net farm income during that period did not experience similar growth. In 1971, for example, the annual average appreciation in capital value of farms represented no more than 11 per cent of total real income; by 1980 this capital appreciation represented 80 per cent of a producer's aggregate real income!

On a national perspective, farm profitability in 1984-85 appears uncertain. The cooling of inflation and the stagnation of farm product price combine to further weaken net farm income. In the determination of net farm income, as well as in the determination of the net profitability of a farm, government subsidies, the existence or nonexistence of production quotas, income stabilization insurance programs, etc., constitute facts worthy of consideration by the lender.

In order to be confident that a farm operation is profitable, the bank must conduct a credit review, develop a credit file, approve, and follow-up on its farm clients. This must be done for farm credit with the same degree of expertise for which each bank is known in other commercial and industrial sectors.

able 3. Indebtedness and other characteristics of Quebec farms by income level

ncome ategory of arms	Number of Farms	Indebtedness Total ($000)	Indebtedness Average per farm $	Farm Sales Total ($000)	Farm Sales Average per farm ($)	Average Off-farm Income ($)	Average Experience (years)
ow-income	11,188	166,820	14,910	125,475	11,215	11,705	21
edium-income	11,213	480,476	42,849	590,621	52,621	4,423	19
gh-income	10,228	1,811,704	177,131	1,752,956	171,387	3,312	15

ource: 1984 Farm Survey, Farm Credit Corporation, Canada.

able 4. Capital Investments (intermediate and long term) in 1983, and planned capital vestments for 1984 by sales category on Quebec farms ($ thousands)

ales category $ thousands)	1983	Planned 1984
0 – 50	$177,202	$117,458
50 – 100	149,366	133,835
100 – 200	243,028	151,078
	$569,596	$402,371

ource: 1984 Farm Survey, Farm Credit Corporation, Canada.

able 5. Capital investments in 1983 and planned capital investments for 1984 on Que- ec farms, by type of production ($ thousands)

ype	1983	Planned 1984
airy	$307,318	$238,559
ash Crops	81,311	56,460
ork	54,479	23,645
ther	130,671	91,013
	$573,779	$409,677

ource: 1984 Farm Survey, Farm Credit Corporation.

AGRICULTURAL FINANCE

What Others Recommend

by Marcel J. Couture
Agricultural Economist
Macdonald College

Four organizations with a high degree of interest in the topic of agricultural credit in Quebec were invited to express their views and propose solutions, both in the short term and the long term, regarding the direction that should be taken in the area of farm finance in the years to come.

The four organizations which have been invited to participate in this article are:

a) L'Office du Crédit Agricole du Québec (OCAQ),
b) L'Union des Producteurs Agricoles (UPA),
c) Farm Credit Corporation (FCC),
d) The Quebec Farmers' Association (QFA).

In reviewing the contributions of these organizations, the author was very pleased to note how much change has occurred in the last few years in their attitudes and views regarding the general direction agriculture should go. I feel that *once again,* productivity and efficiency through better training programs for present and future farmers, and better quality and quantity of extension programs are respectable topics! This is welcome, indeed, since Quebec agriculture *must* be viewed in its Canadian and world context. There is a realization that Quebec must compete with other major partners and cannot count only on direct transfers to producers to maintain itself as a viable industry. During these years of alarmingly growing deficits, it is welcome, indeed, to see that these institutions are prepared to accept some responsibility for the development of agriculture instead of proposing that the government must assume all of the responsibility through direct transfer payments to producers.

A résumé by the author of the suggestions and recommendations made by the four contributors is presented below, and we wish to express our gratitude to the contributors for their excellent contributions to the debate. Their texts, in their entirety, follow the résumé. We will see that the approach differs somewhat for each contributor; however, we will notice that there are also many similarities.

Resumé of the presentations

A. Mr. Camille Moreau, President of OCAQ, makes the point that much more emphasis must be attached to the family farm and that we must do more to ease the transfer of the farm to the young generation. He then goes on to argue that the future of Quebec agriculture *must be* based on "economically viable" units, and that Repayment Capacity is a goal which must be achieved. This, of course, is a very valid point and a very important one.

B. Mr. François Côté, Director, Service d'Études et de Recherches, UPA, emphasizes that the OCAQ must play a more active role in the area of advising producers. He argues that OCAQ should assume, more seriously and efficiently its role as "Credit Consultant" to farmers.

UPA also emphasizes the need for better management training for farmers and suggests that more importance must be attached to productivity. He goes on to suggest some technical improvements to the way OCAQ operates, which would improve its service to farm clients, and suggests some policies better adapted to the needs of the producers. One of the suggestions which stands out is the one whereby beginning farmers would receive some financial assistance, based on an escalating interest rate, with three per cent as the starting point.

Another very interesting suggestion relates to part-time farmers and the fact that we must give them greater recognition and accept, and even encourage, their contribution to Quebec agriculture. Given the present trend toward more off-farm income as we diversify our agriculture, I agree with Mr. Côté that we must change our structures and encourage part-time farmers instead of discouraging them. (The areas of beef production, cereals, and horticulture production are prime examples of productions where we will see more and more off-farm income as a way to contribute to better repayment capacity and better standards of living on the farm.)

C. Dr. Ralph W. Ashmead, Chief, Research Division, FCC, reminds us how fragile some of our foundations are at the present time. He does this through his warning that unless land price inflation again returns to five per cent annually or more, debt financing *will not* be an effective tool to establish, maintain, or expand farm businesses. In other words, this is a reminder that too often, during the last decade or so, farm capital investments were based on great expectations for capital gains based on inflation instead of on increased efficiency and productivity.

Dr. Ashmead also stresses the fact that profitability and better managerial skills through better agricultural training for future farmers is one of the best way out of our present crisis. Dr. Ashmead also suggests many longer term solutions of a technical nature which farmers must consider in order to improve efficiency at the farm level and hence repayment capacity (leasing of assets instead of ownership being one example suggested).

D. Mr. Warren Grapes, President, QFA, warns us that we must make an attempt to better understand farmers and their real financial situation. He warns that some policy makers and their advisors are not as aware of the realities of agriculture as they should be. He goes on to suggest that the present situation must be improved through more direct transfers to producers, through subsidized interest rates, as well as better stabilization and support price policies and, finally, through better tax breaks to producers.

Overall, we have four extremely interesting papers and I hope that these brief comments on each of them will encourage the readers to read on.

L'Office de Crédit Agricole du Québec

by Camille Moreau
President, OCAQ

The reader will understand that given the space available here, it would be quite impossible to go into an in-depth analysis of the farm credit system. I shall attempt to identify, very succinctly, what seems to be the mainstays, I dare say the "back bone" of the system, which is the family farm, and its transfer from one generation to the next.

The survival and the development of the family farm have been an essential preoccupation of the farm credit system. The family farm concept, has, of course, evolved over the years in accordance with the changes in our agriculture. Indeed, agriculture represents the sector of activity where changes have been most pronounced, as may be seen in the evolution in the way of life, in production techniques, in farm structures, and in the marketing of farm products. The farm credit system has accordingly followed an evolutive pattern without getting involved in the debate over the scope of the family farm, be it on the side of the supporters of the small folklore unit or on the side of the supporters of the overly large unit.

This can be verified by referring to the definition of "farm economic unit" found in the very application of all our farm credit programs. Farm economic unit is defined as "any farm which, taking into account all of its resources, is capable of producing a revenue which enables the operator thereof to pay the operating costs thereof, including maintenance and depreciation, to fulfil his obligations and *to support his family adequately.*"

One readily observes the clear reference to the family and the concept of the economic farm unit which identifies to *viability.* In fact, the criteria of *reimbursement capacity* is the minimum requirement that must be met by every applicant to be eligible for our farm credit programs. Moreover, the "Office" must be satisfied that there is an equilibrium between the farm resources and the mobilization of the family resources.

While a certain number of farm loan applications are refused on the basis of reimbursement capacity, others will be refused because of the marginal involvement of the family members in the operation of the farm enterprise, notwithstanding the fact that the enterprise represents an economic farm unit.

Farm transfer from one generation to another has been one of our foremost preoccupations in the application of the farm credit system.

Besides the conventional programs available for the establishment of young farmers, the "Act to promote long-term farm credit by private institutions" provides maximum loans up to 90 per cent of the land value. The Act to promote the development of agricultural exploitation and the Act to promote the establishment of young farmers provide land improvement grants or interest subsidies from which they may choose. Finally, the first objective of the *land bank* is promoting the transfer of the family farm from one generation to the next.

With the help of the various programs available through our system, in point of fact, a total 12,609 persons were able to settle on a farm, whether on an individual basis or within a group over the last 10 years, representing an average of 1,261 per year.

During the fiscal year 1983-84, a total of 38.3 per cent of the number of loans, representing 51.1 per cent of the amounts borrowed were granted for farm settlement. It is also interesting to note that farm settlements represent just about the same profile notwithstanding the type of farming or, for that matter, the relative importance of the various farm productions.

During this period, as can be expected, we have witnessed a marked decrease in the age of the active farm population. Indeed, over the last three years, the average age of all our borrowers has hardly been over 34 years. With regards to farm settlers, the average age is 27 years for the same fiscal year. In 1966, 19.2 per cent of farm settlers were 24 years or under, whereas those of 35 years or more represented 29.3 per cent as compared to 39.4 per cent for the former and 13.2 per cent for the latter in 1983-84.

Notwithstanding the wide range of programs available to promote the establishment of young farmers and the fact that a rather large number of them are effectively settling in agriculture, there remains the fact, however, that the very size of the assets to be transferred does not make it easy to do so. The rather high costs of purchase of quotas, for instance, often become a limiting factor or at the very least a somewhat difficult constraint in some cases.

In closing I would like to take this opportunity to underline the strong participation of private lenders within the framework of the Quebec farm credit system. Thanks to the close collaboration of all participants, the Tandem formula has proven to be most beneficial for Quebec farmers.

The Farm Credit Corporation

by Dr. Ralph W. Ashmead
Chief, Research Division, FCC

Many productive farmers in Canada are burdened by excess debt. The debt has become a problem with current levels of market interest rates and declining commodity prices in many farm enterprises.

Today's farm finance problems are largely a consequence of economic events in the 1970s. The 1970s were characterized by very low real costs of capital due to low levels of nominal interest rates, high rates of agricultural inflation, and high levels of interest subsidization. These events encouraged a level of debt capital financing significantly in excess of the ability of the industry to repay from operating returns. Repayment was anticipated to be sourced from future capital appreciation. The unanticipated rise in nominal interest rates in 1980, the use of subsidized credit in 1981, 1982, and 1983 to cover for the cash flow deficiencies of the industry left a significant part of the industry with debt it could not service given the decline in commodity prices and dropping real estate values.

The solution to the finance problem involves a recognition of several facts. First, unless land price inflation again returns to five per cent annually or

more, debt financing will not be an effective tool to establish, maintain, or expand farm businesses. Second, the industry must find a means whereby it can correlate its financing costs with the profitability of the sector.

The solution to handling the problems of farmers with excess debt will require cooperation between all lenders and will include debt write-offs, debt set-aside, rebates, and subsidies. It also will require a greater level of financial management skills both on the part of lenders and farmers, the application of modern management accounting systems on farm operations, and the better use of management information for decision-making.

The longer term solutions will require the development of mortgage instruments which bear interest rates based on the returns to farm assets and which are indexed to relevant measures of profitability such as commodity prices or farm output price indexes. As important, major efforts must be made to increase the flow of equity capital into the farm sector. This can be accomplished through more extensive leasing of assests, particularly by establishing farmers but more significantly through the establishment of a formal mechanism to channel equity funds into the industry. A mechanism such as a farm land mutual equity fund supported and managed by the agriculture industry would allow for the direct equity investment in agriculture by retiring farmers, operating farmers, private and institutional investors. These equity funds would be used for direct investment in farm real estate. Farmers overcapitalized on real estate could sell part of their buildings to the fund on a sale-leaseback arrangement. The farmer would be required to participate in a minor way by purchasing some shares of the funds and, if desired, could continue to buy additional shares which could eventually be redeemable for ownership of the original farm real estate.

In summary, the current financial concerns will require some drastic action for the proportion which are burdened with excess debt. The longer term problems will require a better link between financing costs and farm profitability and will require less reliance on debt financing through the encouragement of a greater supply of equity capital to the industry.

L'Union des Producteurs Agricoles

François Côté
Director, Service d'Études et de Recherches
UPA

A few weeks ago, the Union des producteurs agricoles (UPA) appeared before the parliamentary commission on agriculture to present its views on the subject of agricultural financing. Outlined below are the points and recommendations made by the UPA at this meeting.

Before discussing proposed reforms to Quebec's agricultural financing policy, the UPA approached the question of financing by placing it within the context of agricultural development in Quebec and Canada as a whole over the last few years. The UPA's presentation highlighted the following points:

- Agriculture in Quebec and elsewhere has been committed to increasing productivity for many years. As in all other sectors of the economy, productivity gains are the result of improved knowledge, improved techniques, and increased utilization of capital for production purposes. The financing of investments is one of the main driving forces behind the development of agriculture into a more efficient and competitive industry.
- Efforts made to develop Quebec agriculture over the last 15 years have produced results. Quebec significantly increased its production of pork and grain and also increased its production of vegetables, lamb, honey, maple syrup, rabbit, and other agricultural products. Slaughter-cattle production has been fairly stable over recent years but has fallen off considerably in the rest of Canada and the U.S.
- The 70s were very good years for agricultural investment everywhere, including Quebec. A marked increase in net farm income was recorded in 1973-74-75. What's more, real interest rates (nominal interest rates less inflation rates) were very low. These two factors explain the heavy demand for farm land and consequently the sharp rise in land values. Land values climbed rapidly as farmers themselves were influenced by the prevailing euphoria and bought up farm land as a hedge against inflation. This was a rising market, and they hoped values would continue to rise. Lenders granted loans with the same idea in mind. In many cases though, the additional income generated by the acquired properties did not justify the heavy borrowing.
- Since 1981 the economic situation has changed dramatically. Real interest rates today are at record levels. This predicament only aggravates the plight of the important pork, grain, and beef markets where soaring inflation has pushed up production costs while prices are sagging.
- The prospects for agriculture in Quebec and around the world look grim for the years ahead. There is a trend towards world surpluses of grain compared to solvent demand; moreover, the American government has indicated its intention to lower support prices in the U.S. which could lead to price-cutting in overseas markets. Lower prices and profitability for grain will inevitably translate into lower profitability in unregulated livestock production, particularly pork.

A Positive Role

It is in this perspective that agricultural financing in Quebec must be seen.

For UPA, the financing mechanisms put in place by the Quebec government and administered by the Office du crédit agricole (OCA) have played a positive role in the development of Quebec agriculture, despite the faults attributed to it.

Considering the increased stature of the OCA (75 per cent of long-term credit and 63 per cent of all credit supplied to Quebec farmers), it is only normal for it to be the target of criticism and controversy. Nonetheless, we must not lose sight of the positive role it has played and could play in years to come. And at the same time, even though certain bad investments were made in agriculture in the late 70s, we must not forget that agriculture will always need credit to finance its development and to finance farm transfers.

Having said this, the UPA is calling for major reforms to Quebec's agricultural financing system. It is advocating change in the following three areas: OCA's operation, farm credit policies, and farm management.

OCA's Operation

We believe the OCA's operation could be improved in the following ways:

- The Office should take its role as *credit consultant* to farmers more seriously and efficiently. This implies that officers should be competent enough and spend the time needed to analyze and discuss investment projects, consider alternatives and explain clearly and openly the decisions taken by the Office.

Besides this very general but also very basic point, a number of very concrete and precise measures should be taken to improve the OCA's operation.

- Delays should not extend beyond two months, from the time of receiving the loan application to the granting of funds. The processing of requests takes anywhere from four to six months at the present time.
- Farmers should be allowed to choose the consultant with whom they wish to deal.
- The value of assets required to guarantee a loan should correspond to that of the loan and should be clearly stated on the official documents.
- Farmers should not be forced to place their working fund in medium- and long-term investments.
- The OCA should take measures to improve and speed up discussions with the Farm Credit Corporation on the sharing out of guarantees.
- As much as possible, a loan application should be analyzed on the basis of the producer's figure, and not on standard budgets and average figures.
- Producers should not be urged to produce on an "integration" basis.
- The OCA should not impose 20-year terms for the repayment of long-term loans and should acknowledge that it is in the interest of many borrowers to repay over 29 years.

Farm Credit Policies

We advocate the following changes to the *policies* implemented by the OCA.

- Formulas must be investigated to facilitate farm purchases by young people and thus avoid the disintegration of farming operations. The UPA proposes:

— that financial assistance to young farmers who are setting up a business be increased by replacing the $50,000 no-interest-loan for a five-year period by a $150,000-loan at an escalating interest rate, to be three per cent the first year and going up by one-half per cent each year thereafter. This loan would be in addition to the "setting-up" subsidy which would be increased from $8,000 to $15,000;

— that financing through farm sellers be encouraged by applying the same loan guarantees and subsidized interest rates to loans granted by sellers as to loans granted by financial institutions.

- Part-time farming must receive greater recognition in productions where, for reasons of profitability or because of the seasonal nature of the production, it is currently very difficult to live off the production full-time. In pursuing this direction, we must ensure that government aid is not directed toward futile projects or to those who are comfortably off and who do not need assistance.
- The ceilings of guaranteed and subsidized loans must be indexed; ceilings which despite inflation have remained the same since 1978.
- A 10 per cent interest limit must apply to long-term loans.
- The production credit (short term) must be improved by speeding up decision-making, facilitating loan renewal, and relaxing administrative regulations.

Financial Management

Farmers' recourse to loans is a necessity we cannot deny. Such recourse may be an advantage or a disadvantage, depending on how the borrowed money is used. Just as it is possible to invest well and make progress, it is possible to invest badly and be overwhelmed by a heavy debt burden. With escalating farm values and sales figures, bad decisions and mismanagement can be very costly and sometimes fatal.

Government policies just as actions taken by farm groups, as a matter of priority, provide producers with the instruments and information necessary to operate in an environment where financial management is a determining factor in farm profitability.

Realistically, this analysis could be translated into the following measures:

- It would be logical and desirable for the OCA to require borrowers to do recognized accounting, subject to an appropriate follow-up. This could be perceived as a constraint by many, but we believe farmers would come out of it on the winning side in the end. The truth is that accounting is basic and indispensable to financial management, and producers who neglect to do their homework are inviting problems.
- The farm management groups program (syndicats de gestion) must be considered as a number one priority for the future of agriculture.
- Any government action, particularly in the area of education, should be largely concerned with financial management.

This concludes a summary of the views presented by UPA to the parliamentary commission on agriculture.

As for the farm community, we must continue to reflect on agricultural financing and the transfer of farm operations. There is room for new and innovative ideas that can help farmers face these problems.

The Quebec Farmers' Association

by Warren Grapes
President, QFA

Anyone and everyone directly connected to farming says the same thing. They all agree that farming is in serious trouble, financially and in terms of numbers. This trouble is caused by a large number of variables that directly influence farm cash returns, i.e., high input prices compared to low farm gate revenues, interest rates, and farm and equipment values.

We (the farmers) know that all these things tossed together make farming the riskiest sector of the Canadian economy and I haven't yet mentioned *weather,* or pests and diseases!

Our hold on our survival is tenacious at the best of times but at present we are witnessing a major threat not only to the livelihoods of thousands of young, progressive farmers but also to the fabric of Canadian agriculture as a family farm-based industry.

Farmers represent only four per cent of the population, but they supply directly or indirectly 40 per cent of the

jobs in Canada and now one-third of these farmers are in severe financial difficulties. Does this mean that 13 per cent of all Canadian jobs are in jeopardy of disappearing? Does the Canadian population realize what is going on? I think not. We see high-level bank executives labelling farmers as incompetents and gamblers, thereby showing a sad lack of competence in understanding the real nature of the farm situation. Finance Minister Wilson's Department appears to be in the same situation; while 38,000 of Canada's younger, most productive commercial farmers are in very severe financial difficulty, they have the audacity to suggest in a recent discussion paper that farmers are nine times as wealthy as the average Canadian and that a significant proportion of high-income farmers pay no tax at all.

Today nearly all farmers, including those with little or no debt, are worse off financially now than they were three years ago. Their incomes are generally lower — net farm income declined by 38 per cent in 1983. In addition to lower incomes, most farmers have also experienced declines in the market values of their assets. In general the hardest hit are young farmers with large operations put together recently with large amounts of borrowed funds.

According to the Farm Credit Corporation, one-third of Canada's farmers owe 85 per cent of the total farming debt now at $21 billion. Also the one-third of the farmers who have 85 per cent of the debt account for 53 per cent of all farm revenues.

When profits were high, interest rates were very low and land prices were booming in the 1970s and farmers could realize gains of up to 19 per cent on land at purchase time. Today, with commodity prices down, interest rates up, and land prices falling, the cost of carrying land has shot up to 20 per cent of the purchase price.

In summary, about 25 per cent of Canada's farmers are experiencing moderate to severe financial stress following three years of low incomes, declining asset values, bad weather conditions, and high interest rates.

From this we can draw one thought: that when the going gets tough, the tough get going and *farmers* better than anyone recognize that it is a tough world out there and they better than anyone will buckle down, survive, and continue to produce food efficiently for the Canadian people.

While there tends to be a general gloominess about the Canadian and United States agricultural outlook for the reasons I have described above, as a farmer I am positive about the fundamental worth of the farm industry today. Investments into the farm community and to its people could and would pay handsomely in the future if the correct decisions are taken now. Desertion and neglect could have only disastrous after effects.

Knowing this, it would serve us well to suggest and implement some measures that would preserve and assist farmers in their endeavours. At this point I would like to put forward the suggestions presented by the Canadian Federation of Agriculture and suggest that we support them. They are:

1. To put in place quickly a program of assisted credit, on a selective basis, combined with the best possible financial consultancy and mechanisms for arriving at farmer-creditor arrangements. We know this is not an easy thing to do, and involves some cost, but we do believe the alternative —

(Continued on page 25)

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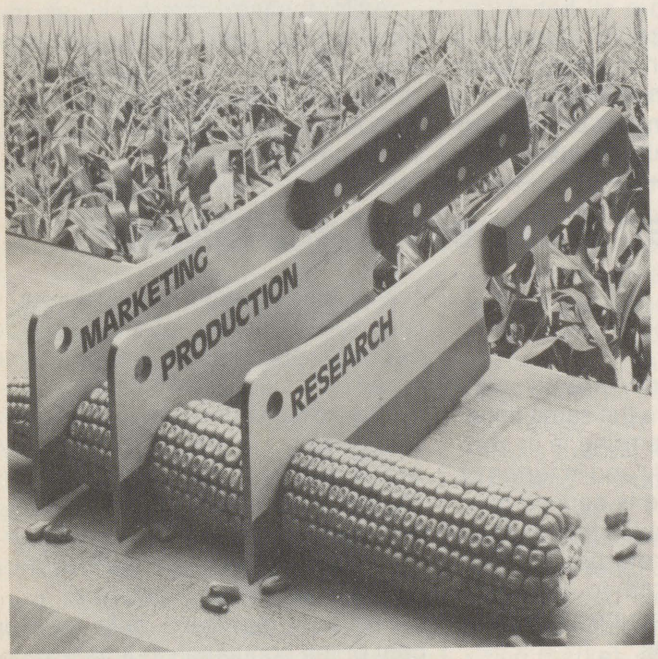

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FOUR POINTS OF VIEW ON . . .

. . . Establishment of Youth in Agriculture

One of the more serious moments at this year's successful College Royal was a conference on the "Establishment of Youth in Agriculture." The four speakers tackling this subject were Marcel J. Couture, Assistant Director of the Diploma in Agriculture Program and Director of Extension at Macdonald College, Suzelle Barrington, a Regional Engineer for the Quebec Ministry of Agriculture, Randal Goodfellow, Agrologist for the Bank of Montreal for eastern Ontario and western Quebec, and André Drapeau, Secretary for the Fédération de la relève agricole du Québec.

The conference was organized by Pierre Brault, who is a BSc. (Agr) student majoring in General Agriculture. Mr. Brault is also this year's President of the Agricultural Undergraduate Society.

Participating in the College Royal conference were, 1 to r, Marcel Couture, Suzelle Barrington, Randal Goodfellow, André Drapeau, and Pierre Brault.

The first three speakers have farm backgrounds and are Macdonald graduates. Marcel Couture is a farm management specialist. Aside from being with the Ministry of Agriculture, Suzelle Barrington helps her husband on their farm near Howick.

As we have been delving into farm financing in this issue, we thought the following edited versions of their presentations would be of special interest.

RAISING QUESTIONS

by Marcel J. Couture
Assistant Director
Diploma in Agriculture Program and
Director, Extension Services

I am not going to try to solve all the problems of agriculture here today; they are too complicated, but I would like to raise several basic questions that I feel our politicians and our farmers are not ready to raise. I believe that someone should, and I feel that a university is a good neutral ground to do this.

First, may I say that there are tremendous opportunities in agriculture. We all know that there is a great need for food; therefore the business of farming is a good one. In 10 to 12 years Canada alone will have 28 million people to feed, and we must not forget our export markets. But that is the future; what is the situation at present?

Based on the last Canada census, more than 23,000 farms have disappeared from Quebec from 1971 to 1981. During the same period the value of farm assets has increased eightfold. From 1981 to 1984, the equity of Canadian farms has decreased from 80 to 74 per cent. Over 7,000 Quebec farms are at present in financial difficulty, and Quebec farms have the highest debt load in Canada, with an average of $177,000 debt per farm.

On the other hand, we must also note that many of our farmers do own 75 to 100 per cent of their farms and, therefore, do not have any financing problems and are doing quite well — as a matter of fact, many are doing extremely well, and we do not hear much about them. In this presentation, since we are dealing with the establishment of youth in agriculture, I will discuss the problem of those who usually have high debts.

For many farmers, the problem stems back to the period in the 70s when many farmers speculated on the value of quotas and/or the value of farm land, often with no concern for efficiency or productivity.

This was a change from the years when we had 4,500 farmers on the Canfarm accounting system in Quebec. In those days, Farm Management was important! Even Farm Credit Corporation had "Supervised" loans, i.e., loans were made to young farmers on the condition that they be on an accounting system and that they received and used farm management assistance. We know that very few of those young farmers ever went bankrupt and most are successful farmers today.

In the mid-seventies, all this attention to farm management disappeared. Farm assets and farm land went up in value at a tremendous rate. On the other hand, subsidized interest rates during a period of high inflation led to speculation and, often, to a real interest rate that was negative (the inflation rate was higher than the

actual interest rate paid by the farmer!). As a result, it became extremely profitable to invest in capital assets. Farmers became speculators. In the early 80s, came high interest rates (the highest was in August 1981, when non subsidized rates reached over 22 per cent). This led to the crisis we now face. No clear data are available for Quebec, but in Ontario it is estimated that land value dropped by $5 billion in 1983 alone! Since the debts remained, this led to the decrease in equity and, therefore, financial stress and, for many, bankruptcy.

Farming, a Complex Business

Farming has become very complex. A typical farm can easily have $500,000 worth of assets; machines costing $80,000 or more, gross sales of more than $200,000, a line of credit of $100,000 and more at the bank, etc.

Farmers are entrepreneurs, business men, bookkeepers, mechanics, and so on. They must know about legal problems, nutrition, pesticides, cope with regulations on the environment, know about taxes and farm transfer problems. Soon, many will use microcomputers.

Farmers must deal with agronomes, bankers, representatives of agribusiness, with civil servants, legislators, and regulators. They must face very difficult and complex problems. In other words, farming has become a business, like any other — and yet, education has not played an important role in agriculture.

Based on these observations, I would like to raise the following question: "Why is it that when the children want to become lawyers or notaries, ministers or priests, doctors or accountants, farmers send them to the best universities, located far away from the farm, and yet discourage the child or children that will take over the farm from going away to get an agricultural training? If they do encourage their children to get an agricultural education, why do many expect the school to be located close to the barnyard? Is it more important for the children to do the chores, morning and night, than to spent some time studying biology, chemistry, and maths to start getting ready for what the farmers themselves say are the complex problems of agriculture?

Second year Diploma students, 1 to r, Peter MacKinnon, Jean Keurentjes, and Daniel Reichenbach in microcomputer laboratory with instructor Marcel Couture.

In Quebec we know that approximately 88 per cent of our beginning farmers have no *agricultural training* acquired in a school environment whatsoever, not even one course in high school! This is a disgrace. We should not be surprised that young people are having a hard time being successful at farming, and a particularly hard time dealing with finances. Most don't even know what a balance sheet or an income statement looks like, nor what a cash flow is. How can we expect these young people to succeed when over 30 per cent of the BSc. agricultural graduates in some mid-west universities go back to farming. This is the competition we are dealing with!

I question the reasoning behind our governments lending money to people with very limited experience, no managerial training, nor the proven ability to succeed. A cheap credit policy is not the answer. Stability in interest rates would be more important. Too much free money has been given to people who have invested in areas where they had no chance to succeed. Dreams are created and the young farmers are left to face reality entirely on their own!

Some Solutions

Education Again, I suggest that what young farmers really need is proper agricultural training. I admit that the experience on the farm is extremely important, but I can assure you that because a young man or woman is from the farm, does not mean that he or she knows all there is to know about farming. They may know how to drive a tractor or get the manure system going, but many, if not most, of them have very little knowledge of finance or anything to do with the "business" side of the enterprise. They may know how to operate the sprayer, but they don't know how to calibrate it. Practical experience on the farm is very important, but a great deal more is needed in today's modern context.

Markets Let's not get people into agriculture unless we know we can market their products. A couple of years ago, maple syrup was exciting, and farmers were getting $40,000 or more in government grants and subsidies in order to get into the business. A few years later, we ended up with maple syrup lying in storage. In setting up our "production" oriented policies, we overlooked the marketing strategies. Market research is one of the first things that has to be done. Our agriculture cannot afford these short-sighted plans based on things other than a healthy long-term agriculture.

Extension Programs Extension programs in this province are not as good as they should be. While western universities, for example, are very involved in extension programs, both faculties of agriculture in this province have been deliberately kept out of

extension. Our faculties do not get any government funding for extension purposes. Government must help our faculties of agriculture so that the results of their research can go out to the farm gates. This is not being done at present. Universities are often blamed that the results of their research do not get to the farm gate. This is very true. We are not funding them to do this; therefore, they cannot do anything else! We accuse our agricultural faculties of being academic "Ivory Towers!" I suggest to you that we have not chosen this path! We were forced into it, and I will also say to you, "Give us the funding, place M.A.P.A.Q. employees on our campus, and we will link research to reality!"

A Final Question

In the future, should subsidies and grants be attached to a proven ability to use modern technology?If a farmer wants assistance, should the government say, "Yes, we will help you, but you are going to keep a good accounting system; you are going to be on DHAS; you are going to do soil analysis; you are going to do feed analysis. Use the modern technology and then we will help you." Efficiency must be encouraged. I think we have often been encouraging mediocrity. Farmers must be encouraged to use all the tools that are available. Examples of these sorts of programs are plentiful. An example can be found in Nova Scotia, where young people wanting to acquire agricultural credit (in the field of hog production) must take a course of approximately three weeks in that field of expertise in order to be eligible. Three weeks is not very much time, but it is a step in the right direction.

Governments are responsible for the taxpayers' money. We have tremendous deficits in this country and in this province, and I believe that society cannot afford them anymore. We have got to be more productive in order to compete with the rest of the world.

Let's make up our minds. If we really believe that agriculture is complex, let's treat it as a profession. Let's help our young people. Let's train them before they go into farming, and they will master their own futures.

I would like to leave you with the following thought. Alvin Toffler, in his book *Future Shock,* said: "Tomorrow's illiterate will not be the man who can't read; he will be the man who has not learned to learn."

GETTING ESTABLISHED HAS NEVER BEEN EASY

by Suzelle Barrington
Regional Engineer,
Quebec Ministry of Agriculture

It has never been easy to get established on a farm. Being a member of a third consecutive farming generation, I'd like to share some of these establishment problems with you, and perhaps this historical development will help us to understand some of our present problems.

My grandfather, in the early 1900s, purchased a farm — rather a woodlot — in Ontario at the outskirts of a small municipality called Moose Creek. Land wasn't worth much then, but you had to clear it before farming it. The farm buildings were built from the wood cut during the clearing. That was called "starting from scratch." My grandfather's farm was self-sufficient then (much more than today's self-sufficiency program is) with dairy cows, beef, hogs, chickens, and ducks all being raised on the farm. Whatever meagre farm revenue could be acquired from the sale of cream or livestock provided for basic food supplies and yard goods.

During the mid-1900s the farm was usually given to the youngest son or the one with the least education, farming being a family business of little revenue and requiring only low management skills. All you had to have was muscle because there was hard work, long hours, and not too much money as a reward. Why do some farmers educate some of their kids on the front steps of the house? Possibly it stems from this old idea of farming, although I think it is changing.

As my grandfather couldn't provide all his sons with a farm, my father came to Montreal in order to get a job. He was able to put some money aside and around 1947 invested it in a farm adjacent to my grandfather's. There was some clearing to be done and buildings to be built. Even when I was at Macdonald, he was still picking stones out of his fields to make them a little more tillable. That's why I felt more at home when I worked in Huntingdon than I do in Howick because they have more stones! In Howick you have to plough 100 acres or more before you can plough up a stone!

Around 1958 my father was able to purchase his neighbour's farm, thus increasing his tillable acreage to 185 acres and acquiring a good size barn. His total debt to the Farm Credit Corporation then was something like $29,000 at five per cent interest which required two yearly payments of $850. This left very little loose cash to live on and my mother went back to teaching to help out. My father continued to improve the farm and, though his loans went up, the standards of living for all family farms also started to rise. Milk prices, which had remained at $3.50/100 pounds until the installation of a milk marketing board, were, around 1969, reaching an all time level of $7.50/100 pounds.

It is during this period, from 1970 to 1980, that the Canadian agricultural industry lived through a period of drastic changes, almost an "agricultural revolution." During the 70s agriculture became a profitable industry. What economical forces brought about this change? One reason was that corn was introduced into the Ottawa and Montreal areas: varieties of corn better adapted to our cool weather provided a cash crop of higher value. At the same time, Ontario and Quebec agriculture started to diversify itself, perhaps following a better Canadian standard of living and a stronger demand for more expensive food products. Again, this revolution made agriculture a *true* business. Farm *net values* started to increase in parallel with the profitability of the products. At the same time, farmers worked at maintaining an efficiency equal to the rate of inflation, through mechanization, intensification, and specialization. The self-sufficient farms faded out of sight.

From 1970 to 1980 a lot of urban people and foreigners found that our farm land was a good place in which to invest money. Land went from $200 to $2,000 an acre in the Montreal area. What young farmer's son could com-

pete with that kind of money? Agriculture became profitable. You could get good returns. There was no way that the revenue we were getting out of our produce could keep up with that.

If you were to buy land at $2,000 an acre through the Farm Credit Corporation, for example, that meant a lease of $215 per acre at 10 per cent interest. Even growing corn you could not make that money back.

All agricultural production that operated through a marketing system similar to the dairy industry increased the produce costs at a rate equal to inflation, thus increasing the price of purchasing quota.

The dairy industry is one of the most profitable businesses there is in Canada today but the quota price is also very expensive. We are finding ourselves in a position at the beginning of 1985 where our farms are priced out of their net returns. Our farm land is too expensive for the market price of grain. Dairy production quota is worth $6,000 per cow, or about six times the price of the cow itself. Beef prices, having remained more or less stable since 1975, do not justify our present high farm costs.

The situation is such that unless an establishing farmer has a fair sum of cash to invest or unless his father is willing to transfer his farm at a cut price, no one can enter the agricultural industry. From 1985 onward, economists foresee a decrease in farm immovable values. Is this factor going to provide a wider opportunity to the establishing farmer? Are there other solutions to his dilemma?

In 1981 the Quebec Ministry of Agriculture promised to help young farmers through better credit facilities and insured revenue. Have these two measures provided any help?

I would like to give you a few figures concerning the insurance on revenue and the way the government calculates its cost of production.

In beef production, for example, when they calculate your cost of production, they assume that the land is clear, that there is no money owing on the land. For a 400-head operation they assume that you have a net value of $320,000 in your pocket. You have a farm of so many acres, you have had the capital to put on two-thirds of the cost of the building — you borrowed about one-third and you borrowed about half the value of the machinery. Now if you want to make say $15,000 a year with your 400 head, you will need $½ million.

Fattening hogs is not as drastic a situation, but let us assume that you bought the farm with $115,000 in your pocket; for cash crops, they assume that you own the land and the machinery. You will have to invest $¼ million in the farm before you start making any money on these programs.

These programs are fine for the person who started 10 years ago, but the young farmer who is starting today should consider the situation very carefully. A grant of $40,000 seems like a lot of money for a beef program, and a young farmer may think that the insurance on revenue is going to give him so many dollars a head every year and he'll make some money, but it hasn't stopped some from going bankrupt after a year or two. Insurance on revenue doesn't answer all the problems of a young farmer establishing himself today.

Going into partnership with your father may be another concern facing a young farmer. Older people have been farming a certain way and have acquired a certain attitude. If you have been putting 50 pounds of fertilizer on your corn, for example, it's hard to understand why somebody should want to put on 200 pounds — he's heading for bankruptcy!

You may also have to make changes to the farm. My husband has a field that has no tile drainage, and last year he took off about 50 bales of poor quality hay while he took 200 bales of excellent quality alfalfa from the field right next to it that is tile drained. Tile drainage can pay even in one year, but you have to invest $200 to $300 per acre.

If he doesn't have $½ million in his pocket, it's hard for a young person to get into the agricultural industry. If your father is already a farmer and is willing to let you have his $¾ million farm for about $250,000, then that is probably the best solution. But what about you? Your father may only have a loan for $50,000 or $100,000, but you are taking over a farm that is not only going to have to produce a good salary to pay the $50,000 or so debt but it may also be $300,000 because you need to pay your father back. This still has to be calculated. I have a lot of people coming in to see me who say, "I want to buy my father's farm," and I have to tell them that one of the biggest problems is that when you start to calculate the revenue on the farm, it will never meet the loan that has to be met.

NEW FARMERS MUST BE ABOVE AVERAGE

by Randal Goodfellow
Agrologist,
Bank of Montreal

Some of the opinions I am going to express are shared by the general banking community and others are my own personal observations.

First of all, may I say that I believe that the banking community is adequately serving the needs of farmers. The banking community:

— offers fixed or floating rate loans on the short, intermediate, and long-term;

— can fix interest rates up to five years;

— can lend up to 75 per cent of available security (if more required, usually the project for which the money is to be borrowed has difficulty cash flowing).

What type of business are banks looking for in the farm community? We are looking for good business. We are looking for long term economically sound farms; farms which cover operating expenses, reimburse debts, provide adequate living funds, and a residual to handle the unforeseen as well as expansion. We are looking for *professional* farmers who keep good records and know the difference between tax and management accounting and know how to make use of this. *No shoe boxes, please!* We are looking for sound planning and for farmers who present and conduct themselves professionally.

New Farmers Needed?

I raise the question: Do we need any new farmers? If we look at the commodities we most commonly produce, we don't need any additional farmers. We already produce much more than we need domestically and, therefore, must depend on exports to the world market. If we look at the two commodi-

ties — grain and dairy products — that Canada must sell in large quantities on the international market, we can see that we are facing ever-increasing price competition as is evident in the recent 25-cent increase in the export levy which dairy farmers must pay. In addition, some countries which were once net importers of the commodities we produce are now net exporters. For example, Russia and China are traditional importers of grain, but they are requiring less and less each year, and it is predicted that they will be self-sufficient in the 1990s, if not net exporters. India used to be a have-not country and a large net importer of grain. This year India is a net exporter of grain. Not only has that market for our grain disappeared but we also now have another competitor in the competition for the remaining markets. This situation could take place in Russia and China as well. What are the requirements for agricultural production: land base, technology, manpower, and motivation. Russia and China have the first three; they are working on the fourth.

Why do I mention the above when talking about establishing young farmers? Only to say that we can no longer *depend* on the world markets to absorb production which is surplus to our own domestic needs.

I am suggesting that young farmers consider establishing themselves in productions which are not in surplus to our domestic needs and that they attempt to find their own markets for their produce. This will require a great deal of entrepreneurship by the young farmer which would mean that he should have to be an above average individual, but who other than above average individuals are able to get into agriculture with a good possibility of surviving in the business over the long term?

Some of the Problems

Let's look at the problem of establishing a young farmer on the traditional Quebec dairy farm. The following figures in Table 1 are from the 1984 Farm Credit Corporation Canada Survey. It depicts the average assets and total gross revenue of a Quebec dairy farm.

— If the gross revenue is $82,203, the net revenue will be in the neighbourhood of 40 per cent or $33,000.

Table 1. Average assets and total gross revenues of Quebec Farms, 1984

	Average Total Assets	Total Gross Revenue
Dairy	$347,824	$ 82,203
Pork	264,443	118,296
Cash Crop	277,140	65,002
Beef	171,852	21,685

(Source Farm Credit Corporation 1984 Survey)

Figure 1 **RETURNING TO THE FARM**

1. FARM REVENUE AND WORKLOAD ADEQUATE TO ABSORB NEW MEMBER
2. FARM REVENUE AND/OR WORKLOAD NOT ADEQUATE TO ABSORB NEW MEMBER *BUT* EXPANSION CAN BE CARRIED OUT TO ACCOMMODATE NEW MEMBER
3. FARM REVENUE OR DEBT LOAD NOT ADEQUATE TO ABSORB NEW MEMBER BECAUSE DEBT LOAD EXPANSION WOULD NOT BE FEASIBLE.
4. NO FARM IN THE IMMEDIATE FAMILY.

From this net revenue, $10,000 would have to be used to service a cost of living. The balance would have to be used to service immediate and long-term debt. This $23,000 will only safely service the intermediate and long-term principal and interest payments on $150,000-$160,000 of debt. Thus the farmer would need $188,000 to $198,000 net worth — 55 per cent — to make this farm cash flow.

— An old rule of thumb is that the real value of a farm is three times the gross income, i.e., 3 × $82,000 = $246,000. Why then are the total assets valued at $347,824, approximately $101,000 above the real value of the farm, considering revenue generated? Consider the following:

1. Inflation in the mid to late 70s, too easy credit, and government give-away programs can be blamed for this over value of farms. This is being slowly rectified by generally decreasing farm asset values.

2. Existing farmers must share part of the responsibility for the over value of their assets versus an income stream which their farm assets can generate.

3. There were too many capital investments made to the farm that were not truly justified, i.e., they didn't improve the income stream proportionately to the capital investment (many of the farmers who are now in trouble can attribute their problems to this reason, too many capital purchases, improvements versus improvement in net income stream). The capital cost of certain farm machinery and structures was and is not justified versus the net improvement in income which they produce.

Naturally farmers wanting to sell their farms want to recapture their capital investments, and a young farmer establishing him/herself can't afford nor justify paying for any of these capital investments which don't truly carry their own weight.

Goals Not Just Dreams

Figure 1 shows situations which the young person may face who wishes to make farming his immediate or eventual long-term profession. As we can see in situation 1 and 2, the revenue and workload is sufficient or can be made economically sufficient to absorb a new member. In these two situations a young person can return to the family farm when he has finished his secondary, college, or university education.

In the third and fourth situation the young person must work away from the farm in order to accumulate savings to form a down payment to purchase the farm outright at a later date. May I point out the following:

— one must be strong in goal setting, not just have dreams.

— if one is saving to purchase a farm, one must have goals for saving or an adequate down payment on a farm may never materialize.

— Once on the farm goal setting is even more essential!

Young people that are faced with situations 3 and 4 in Figure 1 should consider furthering their education which

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SOME SUGGESTED SOLUTIONS

by André Drapeau
Secretary
Fédération de la relève agricole du Québec

I would like to express the views of some Quebec young farmers on the problems they face in setting up in business and the solutions they contemplate. First, a brief summary of what the Federation de la relève agricole is all about.

The Federation is made up of 1,300 young men and women between the ages of 18 and 35 who are either interested in farming, aspiring farmers, or farmers just starting out. These young people, from 10 regions in Quebec, joined together so that they could improve conditions facing young farmers and better prepare themselves for the challenges of the farming profession. They agreed on the structure they want and implanted it at the local, regional, and provincial level.

Young people from two or three rural communities gather in local groups mainly for three types of activities: training, information, and social. All the local groups of one area make up the regional syndicate. Efforts at the regional level are largely aimed at developing policies and proposing action that will make it easier for young people to set themselves up in farming. Training and information activities are also held at the local level.

Finally, the provincial level, like its affiliated syndicates, has as its objective to promote, defend, and develop the interests of its members. It plays a principal role in three areas: coordination, representation, and formulation of requests.

Some suggested solutions are:

Education Young farmers today realize the need for good professional training when it comes to starting in business and yet figures show that only 12 to 20 per cent of young people going into farming have actually completed a farm training program.

In order to get more young people to take training programs we propose:

— that the agriculture related courses taken by young people through adult education lead to a diploma;

— that it be possible for young people to go to a CEGEP or Institut de technologie agricole over a five-year period by taking courses from November to March;

— that learning institutions recognize the practical experience gained by young farmers prior to their training;

— that those who complete high school with programs in agriculture be allowed to major in agriculture in CEGEP and then at university.

This is possible in the English sector now but not in the French sector. As long as these changes are not made to our present educational system, young farmers are firmly opposed to training as a prerequisite for obtaining farm credit.

Farm Credit On the subject of farm credit, we propose:

— that the subsidized long-term farm credit maximum be raised from $150,000 to $200,000 for individuals and from $200,000 to $250,000 for a group;

— that the guaranteed maximum be increased from $250,000 to $300,000 for individuals and from $450,000 to $500,000 for groups;

— that there be an eight per cent interest limit on long-term loans;

— that an appeal board be created to hear any farmer who is dissatisfied with the decision taken by the office de credit agricole.

Moreover, young farmers are putting forward two new proposals which they want to see implemented as soon as possible in view of the present economic situation.

First, within the framework of long-term farm credit programs a) young people in the process of setting up a business should be entitled to an escalating interest rate to be two per cent the first year, going up by one per cent each year thereafter until the escalating rate reaches the prevailing subsidized rate and b) the escalating rate should apply to a loan of $200,000 for eligible young farmers and a loan of $250,000 for two or more eligible young people.

Second, the office de credit agricole should encourage financing through the seller of a farm by applying the same guarantee and subsidized interest rate to a loan granted to the seller as to the loan guaranteed by the financial institution.

All proposals dealing with farm credit are essentially aimed at concentrated aid at the beginning of the loan and hence at enhancing the new farmer's competitive edge over farmers who have been in business for a number of years.

Getting established In addition to long-term loans, young people getting into farming are entitled to a setting up subsidy of $8,000 or $50,000 low interest loans for a period of five years. Essentially, young people want the possibility of choosing between two alternatives, because as of December 31, 1985, only the low interest loan will be available. Our calculations show, however, that the $8,000 subsidy is more beneficial in a large number of cases.

Gradual transfer Gradual farm transfer is another area of concern. In many cases the only way to achieve a successful transfer in Quebec today is by forming a parent-child partnership. Young farmers studied a number of gradual transfer methods applied in several countries and were particularly impressed by the New Zealand sharing method. Besides the legal framework of gradual transfer in that country, the system offers incentives to sellers so that they will reinvest their money in agriculture. Such a solution has the added advantage of enabling young people who are not the children of producers to set up in business. Therefore, we are proposing that a task force be set up representing the government, producers, and young farmers to study the possibilities of adapting and applying new gradual transfers here in Quebec.

Land banks Young farmers consider the land bank scheme to be a definite asset. They view it as a way out of having to borrow excessive capital that may be difficult to pay back and also see this as an easier way to finance a business during the first few years. However, we have grave doubts about the government proposal for implementation of the land bank scheme, and are suggesting further regional study by all concerned groups. Based upon regional priorities agreed upon, we suggest that the government invest money to achieve these goals and that in the implementation of land banks priority for the rental and eventual purchase of the land

bank be given to young farmers who are starting out.

The decade of the 80s will be the turning point for agriculture in Quebec leading either to large-scale production or to the preservation of the family farm. Young people want to become producers and not workers employed by large companies. We believe that the young farmers' proposals and demands are geared to promote the accessibility and viability of the family farm.

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inaction — will prove intolerable, and if persisted in, will be cause for great regrets later. Means must be found to keep our productive farmers on the land as long as possible.

2. To put in place stabilization policies that will give all commodity producers the minimum level of security and support they need to make rational production decisions and avoid forced ejection from the industry.

3. To reduce input costs as far as possible.

4. To ensure implementation of rules on claiming of tax losses that minimize speculation by non farmers and use of farming as a tax haven, while at the same time fairly treat the bonafide, part-time farmer.

5. To provide a once-in-a-lifetime exemption from capital gains to bonafide farmers on a limited basis, namely:

i) to index the adjusted cost base; and

ii) to exempt up to $100,000 of taxable capital gains remaining after indexation at a rate of $10,000 for each year the farmer operated the land, up to 10 years.

This retirement protection to the farmer is of increasing importance as land values decline.

Projections to 1991 indicate almost 20,000 fewer farms in Canada than existed in 1981. With this one fact planted solidly in our minds we must do our utmost to maintain Quebec farms as viable enterprises!

Challenges to cope with

WE ALSO OFFER YOU AGRICULTURAL LOANS GUARANTEED BY THE QUEBEC GOVERNMENT

In Agriculture, there are daily challenges. To cope with these means hard work for you and sound financial planning.

The First Bank Agri-Services offer you a complete program of farm financing and management to:

- **increase your farm income**
- **control your operating expenses.**

The First Bank Agri-Services . . . . . the protection of your farming business.

Come and see us !

TOGETHER

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(Continued from page 23)

would enable them to obtain better jobs and therefore make greater savings.

The Right Time

Timeliness of entry into farming is very important. Let's consider an entry into farming this spring. The young person has an adequate down payment to make the cash flow work. The question is: should the person immediately enter agriculture or should he wait another couple of years? If the person waited two more years, he would have two more years of savings with the interest earned on his present savings to be used on his down payment. In addition to this, farm assets are falling and will continue to fall over the following years. The net result may be that the person may have to carry approximately $60,000 less debt if he were to wait an additional two years; long-term viability would be greatly improved.

Conclusion

Let's eliminate one phrase from our language: "The average farmer," as any new farmer must be above average. Don't get discouraged but do set goals.

NEW BRANCH PRESIDENT GRANT ROSS

by Vivian Geeza

"I've always preferred making waves to riding them." Grant Ross, (BSc (Agr) '56) new President of the Macdonald Branch, McGill Alumni, recently looked back on his career since graduation and his future plans for the Branch. "I'm committed to Canadian agriculture," he added, crediting his alma mater with starting him on a stellar career a quarter decade ago.

"Mac gave me some broad insights into future developments in agriculture, kept me looking forward, thinking forward. We received a first class education in terms of scientific training and personal and intellectual growth. Now it's time to pay my dues."

Ross held management and marketing posts for different Canadian agrichemical firms before founding his own company, Agri-Marketing Corp., in 1971. The firm was the first in Canada to handle mold inhibitors and also deals in anti-oxidants, flavours, crop stabilizers, and surfactants, representing Kemin Industries, a United States supplier. Recently, Ross launched Feed Additive Specialties Inc., based in St-Hilaire, Quebec, to manufacture additives for the animal feed trade. "I see many graduates in animal nutrition among my clients," Ross says, "and I like to think the best ones are still Mac grads!"

As President of the Macdonald Branch, Ross leads a dozen executive committee members and a network of class agents and other volunteer alumni leaders. "I'm looking to achieve more understanding among our graduates," he said, "of Mac's activities and aspirations. It's time to rekindle our concern for the College, and offer more grads the opportunity to serve the future — in a way that's most enjoyable and rewarding!"

Ross married a Mac grad, Lorna McIndoe (education degree); the couple has three children and one grandchild. He served as Branch President in 1960. "So I'm being recycled," he says, "and I'm really happy about that. My education here played a great part in my personal success — and it's time to repay that same commitment, together with grads from all the different years, who can reach into themselves and discover the same capacity, time, desire. Communications these days are costly. We need to find ways to make them easier and more relevant, and really spread the word about Mac and its people. I'm glad to have this chance to help."

REUNION '85 PLANS AHEAD Jean McHarg, left, Chairman of Reunion '85 and the 25th anniversary Class Chairman, discusses plans for the upcoming Reunion with President of the Macdonald Branch, Grant Ross, and Special Events Coordinator, Kathryn Whitehurst.

Reunion '85 Class Chairmen

The Reunion '85 Committee is off and running. Spearheaded by Chairman Jean McHarg (also Chairman of this year's 25th anniversary class) the Committee is planning an attractive program of activities to encourage graduates to return to Macdonald College for the Homecoming Weekend on Saturday, September 28, 1985.

Assisted by Class Chairmen, the vital link between Macdonald and its far-flung graduates, the Committee's goal is to surpass the record number of graduates who have returned to the College in previous years . . . no small feat!

At a special reception in April, Class Chairmen will be invited to share ideas about Reunion '85 and give suggestions to the Committee for its general events.

Class Chairmen who are preparing or issuing their class newsletters and questionnaires are as follows below:

If this is a reunion year for you (graduates of years ending in 5 or 0) but your class is not listed below, please contact Susan Reid (514-392-4815) at 3605 Mountain Street, Montreal, Quebec H3G 2M1 and talk over plans for your year.

Ms. Francine Daigneault	— Agriculture & Food Science '80
Mr. Alex McKinney	— Agriculture & Home Economics '65
Mrs. Jean McHarg	— Agriculture & Home Economics '60
Mr. David I. Rankin	— Diploma Agriculture '55
Mr. Donald L. Cole	— Agriculture & Home Economics '55
Mr. Harold D. Blenkhorn	— Agriculture & Home Economics '50
Mr. Robert Flood	— Agriculture '35

Correction

We apologize for incorrectly identifying one of the people in a Reunion '84 photograph in the February Journal. Although Janet Ingram was at Reunion, the person in the photo was Wilda Waldron, wife of Dr. Mark Waldron, BSc (Agr) '59, a former Editor of the Macdonald Journal. (I should have known!)

REFLECTIONS FROM VICTORIA

Though still taking an active interest in research in the Department of Agricultural Chemistry and Physics, Professor Bruce Baker has retired from his teaching duties and other commitments. (See Macdonald Journal, August, 1984, for his thoughts on 38 years at Macdonald.) This retirement has allowed time for other pursuits, particularly travelling, and early last years he visited with Clark and Millie Blackwood in Victoria, B.C. The Blackwoods and Bakers were neighbours at Macdonald for 10 years and Bruce Baker considers Clark Blackwood, who was Dean of the Faculty of Agriculture and Vice Principal (Macdonald College) from 1972 to 1977, "to be one of my best friends." During that visit they chatted briefly for the benefit of Journal readers.

On a recent trip west Bruce Baker, left, visited Clark Blackwood at his Victoria, B.C. home.

Bruce Baker Clark, this is your third year of retirement; are you enjoying yourself?

Clark Blackwood Retirement I consider as a challenge — an opportunity, free of many restraints, to set a pattern of living that is new to me. I am enjoying the challenge, and my only complaint is that time passes too quickly to do all the house-conversions, furniture-making, gardening, swimming, curling, and travelling that are in my ever-changing plans. In fact, the biggest change in my life style is that Millie and I can travel when we (Millie) want. We really enjoy our camper van in the summer, especially exploring Vancouver Island and the west coast.

Bruce Baker Your move to Victoria is the second time that you have encountered a dramatic change in your environment as you were born in Calgary, the great cattle town, then found your way to la belle province, and now you're settled in this "little piece of England." What have you liked and perhaps disliked about these three different environments?

Clark Blackwood Calgary was a great environment to grow up in to develop individual characteristics, especially in the "dirty thirties." Travelling all over southern Alberta with my veterinarian father, teaching in a one-room school north of Edmonton in homesteader country, and going to the University of Alberta with its small enrollment made me realize that hard work was the way of life that I have enjoyed ever since.

Going in 1957 from Saskatoon to Macdonald with all its traditions and joining the close-knit clan of staff and students was a new adventure for me and my family. It wasn't hard to adapt, though it was frustrating at times not to be innovative when opportunities presented themselves because of limitations of money and of tradition in the faculty and the university. I must say that my personal professional career blossomed at Macdonald in a way that reflected the character of the college and I will always be grateful. The best opportunity anyone could have had was to be chairman of a small department that grew and attracted outstanding staff and excellent students.

I can't really comment on Victoria — ask me 10 years from now!

Bruce Baker I am sure that you have reflected on the years spent at Macdonald, first as chairman of microbiology and then as dean. Would you care to single out what you feel were your greatest accomplishments? What were some of the highlights and some of your disappointments?

Clark Blackwood One of the great natural abilities we all have is to look back and remember the best. Both as chairman and dean I suffered through many disappointments but these are overwhelmed by far in remembering outstanding classes, outstanding students, and active, energetic colleagues who contributed ideas and ideals, especially when the going got tough. The esteem I hold for the pride of the administrative staff and the non professional workers at Macdonald who willingly went the extra mile is not diminished in the least by the surprisingly few problems I encountered. They believed in Macdonald and showed it.

Bruce Baker I recall how you succeeded in building up what was then the Agricultural Bacteriology Department into a strong academic and research unit. You then accepted the position of Dean of the Faculty of Agriculture. As you were obviously interested in teaching and research, why did you leave this interesting occupation and accept what would appear to be a thankless job?

Clark Blackwood First, let me say that being Dean and Vice-Principal was not a thankless job. You win some battles and lose some; you win some friends and lose some. However, you have the opportunity to know intimately the aspirations and ideals of most of the staff and many of the students, and my view that the future depended on them first and foremost

and secondly on the buildings and land was reinforced.

Why did I accept the job in 1972? When I came home from sabbatical leave in France, I found the faculty in disarray. The deam was leaving, the Faculty of Education moved downtown, and the students and staff wandered around in the empty spaces with real questions about the future. I accepted the position believing naively that by improving relations with McGill administration we could find in short order a satisfactory solution. I was wrong about the timing as McGill, after 10 to 15 years of growth, had to retrench and at the same time the provincial government was examining all aspects of university education including agriculture. After stumbling and groping for two years, a couple of successes became evident: we had more friends in the McGill family than we knew and most important Mr. David Stewart supported us both morally and financially. The resulting financial support for our new building by our staff, by former students, by friends, and by the business community reestablished our faith in the future. Planning for the new building was continuous and arduous for the next year, but it brought the faculty together in a positive look to the future. In my opinion, the transition from the close-knit student and staff family to the more aggressive and more demanding era of the present was worth the trauma.

Bruce Baker Do you have some exciting plans for the future?

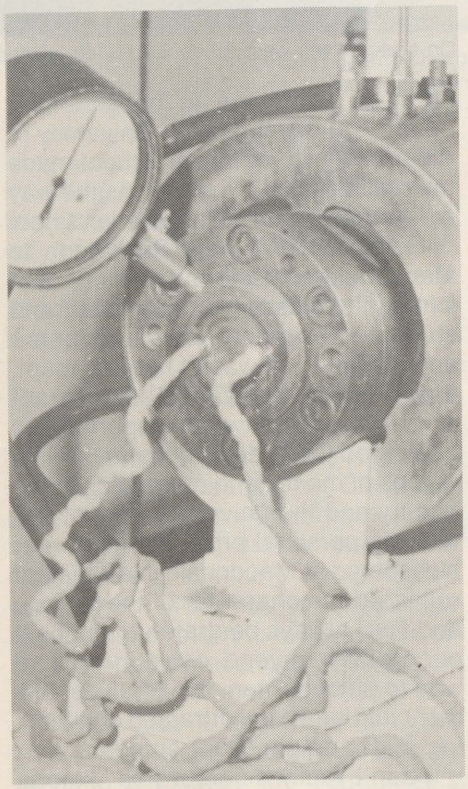
Clark Blackwood We live in exciting times. I have my eyes still on the stars, but the only way to exist happily is to greet each day as an exciting experience, and it quite often is. I miss Macdonald, my friends and colleagues, and especially contact with young, eager students who always kept my viewpoint flexible. I have to learn — and will — to make up for these deficiencies and live a useful and happy life.

Seeking Solutions

Macdonald College is fortunate to have available a modern food pilot plant facility. It is well equipped for general food processing operations such as canning, evaporation, spray drying, blanching, gas packaging, and other common operations.

A variety of disciplines are making use of the facility: Entomology for honey processing, Agricultural Engineering for process simulation and controlled atmosphere storage work, Food Science for general processing, and Microbiology for food irradiation studies. More extensive use of the Pilot Plant is envisaged through contract work with food and allied industries.

A recent acquisition has been a Creusot-Loire twin screw extruder. Extrusion is a relatively new process which is finding ever-widening application in the food industry. A variety of common products can be produced such as pet foods, cheese, crisp breads, and bacon bits. Most of the developments in extrusion have been of a propriatory nature and little fundamental research has been done in relating operating conditions to the nutritional and textural characteristics of the end product. With one of the only major extrusion installations in the Canadian university system, Macdonald College is in a unique position to carry out this type of research.



A Creusot-Loire twin screw extruder.

Licensing Agreement

Macdonald College staff were involved in the first two licensing agreements with the Inventions and Patents Office of McGill University. These agreements included a grain dryer and heat treater invented by Professor Vijaya Raghavan, Agricultural Engineering, and one of his students, Kulbir Pannu, and a mycoherbicide developed by Professor Alan Watson, Plant Science and Professor Alan Gotlieb, from the University of Vermont's Department of Plant and Soil Science.

The dryer, which incorporates a compact and energy-efficient heating component, will be used by farmers, the food processing industry, and dairy and swine operators to process grain for feeding or for storage. The machine will allow farmers the chance to roast soybeans, thus increasing the usefulness of this crop to Quebec animal and cash crop farmers. Full scale production is expected in two years from a prototype being fabricated in Victoriaville under the watchful eye of Kulbir Pannu.

Professors Watson and Gotlieb have obtained an agreement with Mycogen Corporation of San Diego for the use of the biological herbicide developed at Macdonald and the University of Vermont. This herbicide is specific to velvetleaf, a noxious weed which is a problem in corn, soybeans, and many other crops. The major advantage of the herbicide is that it does not pose an environmental hazard and appears to fill a need in the spectrum of existing herbicides which are not effective against velvetleaf. The herbicide is currently being subjected to field trials by Mycogen, who hope to have the product on the market in two years.

Thus Macdonald staff are leading in the commercialization of scientific discoveries, to the eventual benefit of the food producing and processing industries in Quebec.

From Mountain Ash to Earwigs

Eight answers to some 2,200 queries

by Aline Grenier, Francine Poissant and Chantal Rondeau

Summer '84 was again an exceptional year for the Horticultural Information Centre (HIC). Since its formation in 1982, the number of people using the service has been increasing and over 2,200 inquiries for information and advice were handled last summer.

The Centre, funded by the federal government as a Summer Canada Community Project, is a service which enables the amateur gardener to obtain information on various areas related to horticulture. The staff for the summer of '84 consisted of four students from Macdonald College and one from Alfred College in Ontario: Aline Grenier, the director of the project, Ora Kendall, Francine Poissant, Anne Quesnel, and Chantal Rondeau. Gardeners with problems could contact these students by telephone, by letter, or in person. As an additional bonus, the students made house calls, with the understanding that the concerned plant owner was willing to pay for the transportation costs.

An interesting fact is that there is an increasing number of people actively participating in the problem-solving as witnessed by the increasing number of people visiting the centre over the years.

In addition to handling the inquiries, the students set up an information booth during "La Fête de Ste Anne," in Ste Anne de Bellevue and participated as judges for the "Villes et Villages Fleuris" contest held in Pierrefonds. One of the most rewarding events for the staff was the demonstration held for the veterans at the Ste. Anne's Hospital in August. Plant cuttings prepared in advance by the students working at the centre were used to demonstrate the propagation of house plants. In addition to offering them a house plant, the veterans were informed on the techniques of plant maintenance and multiplication. As a follow-up to the demonstration, an information booth was set up one week later to provide supplemental information on horticulture.

HIC staff checking reference material are, 1 to r, Aline Grenier, Chantal Rondeau, and Francine Poissant.

The main concerns voiced by the gardeners utilizing the horticultural service were related to outdoor plants, their problems, care and cultivation. However, the staff also gave advice on other subjects such as house plants, pests, fertilizers, and pesticides.

The following questions and answers highlight the most common queries received at the centre during the summer of '84:

What causes the leaves, at branch tip level, of my Mountain Ash to become black, dried up, and curled?

This disease is called fire blight and may affect Mountain Ash, Crabapple, and apple trees. An additional symptom is that the fruit also dries up, blackens, and shrivels. The only way to control this disease is to prune the infected branches 15 cm (6") below the infected area. If more than one cut has to be done, sterilize your tools between each cut using one part household bleach to nine parts of water. Remove all fallen leaves and burn them. This will reduce the likelihood of reinfection. Avoid too much nitrogen fertilization and control insects.

The leaves and fruit on my apple tree tend to have dark spots. What causes this?

There is a good chance that the problem is caused by a disease called apple scab. Usually, the first symptoms appear on the leaves as yellow pale spots which later become olive green. As the disease becomes more serious, the spotted areas become dry and crack. To control apple scab, remove all fallen leaves and fruit and dispose of them. Timely spraying of fungicides will help to control this disease, and these are available at your garden centre.

How do you prune currants?

Black currants produce best on one-year-old wood. It is desirable, therefore, to remove all wood that is more than three years old. Thin back the bush to 10 to 12 strong shoots comprised of one- and two-year-old wood.

Red and white currants as well as gooseberries produce most of their fruit spurs on two- and three-year-old wood. When pruning, save three or four shoots of each one, two, and three-year-old wood each year. Remove any shoots that are older than three years.

What causes the sudden wilting of raspberry cane tips?

This is most commonly caused by the cane borer and is controlled by cutting the cane at least 15 cm below the bottom of the wilt and destroying the top part.

What causes the bottom half of tomatoes to rot?

This problem is known as blossom-end rot. It often appears after tomato plants have been subjected to rapid soil drying cycles and irregular watering, to long periods of cloudiness followed by periods of intense sunlight, or to overdoses of nitrogenous fertilizer which are suspected of blocking the plants' uptake of calcium. Ways of preventing this non parasitic disease are: 1. Choose a well-drained soil. 2. Have your soil tested for acidity, nitrogen, and calcium, and supplement these nutrients as required. 3. Take care not to hoe or cultivate closer than one foot from the plants so that the roots do not get damaged. 4. Maintain a uniform supply of moisture in the soil. One way to prevent excessive moisture losses is to mulch the soil with either a plastic film or sawdust, peat moss, or something similar. 5. Once the first fruit clusters have shown symptoms of blossom-end rot, apply calcium to the plant. This nutrient is commercially available in most garden centres.

How can I be successful with house plants?

The secret of growing house plants is to provide the right conditions of light, heat, and humidity. When selecting a plant think of the conditions it needs and try to match them with those you can provide. Where humidity is the limiting factor, several methods can be used; set potted plant on pebbles in a dish or tray of shallow water or put damp moss between potted plant and larger pot. Artificial light can be provided in areas where natural light is insufficient. Make certain that the soil mixture you use has the correct proportion of essential plant nutrients as well as enough aeration (vermiculite, perlite). Proper watering and feeding is also important. It is better to provide a copious watering once or twice a week than a light watering every day.

Leaves on a red oak get close scrutiny from, 1 to r, Chantal Rondeau, Ora Kendall, Anne Quesnel, Professor Dan MacArthur, and Francine Poissant.

Fertilizer (liquid or powder) should be applied during the growing season (late spring and summer) after plants have been watered. Concerning heat, most plants grow well in the 18 to 21°C range but others thrive in chilly 13 to 16°C daytime temperatures. Night temperature is important, too, and most plants grow best when there is a 5 to 7°C drop at night. As for insects (aphids, mealy bugs, etc.), usually the commercial products sold in garden centres help to get rid of them (malathion, for example). A good book on the care of house plants will provide you with all the specific care that each plant requires.

My lawn has brown patches which tend to begin at the edges. What is the problem?

If these symptoms appear during prolonged hot, dry summer periods, the chances are good that this is caused by chinch bugs. Lawns infested with chinch bugs may first show small spots of yellowing grass. then large irregular dead patches where the bugs have injured the lawn by sucking out the plant juices. To test for chinch bugs, first select a sunny spot along the border of a yellowed area of lawn. Cut out both ends of a large tin can and push one end of the can into the soil about 5 cm. Fill the can with water. If chinch bugs are present, they will float to the surface of the water. They are about 5-8 cm long and may be reddish or black with a white spot on the back between the wings. A well-fed lawn will discourage this insect. Insecticides can be used and should be applied before a rainfall or use a lawn sprinkler to permit the insecticide to penetrate well into the soil.

What can I do about earwigs?

Since earwigs have just recently been introduced into the Montreal area (so far they are only a problem from Montreal west to the Ontario border), they have no natural predators and consequently there is no one solution to control them. Various control actions are possible. First, debris and other hiding places — compost piles, for example — should be removed or put as far away as possible from the house or garden. The best control method is trapping. Hollow tubes, bamboo sticks, rolled up newspapers, and grooved boards are quite efficient, especially if peanut butter or fish oil is applied to them. The traps should be placed along the house foundations and around the garden. They become more efficient with time as the earwigs leave their scent on them. The trapped earwigs can then be put in oil or soapy water. Chemical sprays tend to be less effective than baits or granular insecticides due to the earwigs' nocturnal habits. These should be used with care and kept away from children and house pets.

FUN FACT FABLE FICTION

by Ralph H. Estey
Emeritus Professor
Department of Plant Science

More Limericks

The craze for the composition and collection of limericks reached a high point throughout North America in the 1920s. Even United States President Woodrow Wilson was a limerick enthusiast. He composed this one:

I sat next to the
Dutchess at tea
It was just as I feared
it would be:
Her rumblings
abdominal
Were truly
phenomenal
And everyone thought
it was me.

Heywood Brown, a popular fiction writer of that era, wrote this one:

There was a young man
with a hernia
Who said to his doctor,
"Goldernia"
When improving my
middle
Be sure you don't fiddle
With matters that do not
concernia."

The vast majority of limericks, like the one below, have no admitted author.

There was a young lady
of Kent
Who said she knew
what it meant
When men asked her
to dine
Gave her cocktails and
wine
She knew what it meant,
but she went.

A Union of Patriotic Women

the Imperial Order of Daughters of the Empire, the I.O.D.E., was the brainchild of Mrs. J. Clark Murray, wife of a McGill University Professor. In January 1900, Mrs. Murray sent telegrams to the mayors of all provincial capitals in Canada inviting women to unite in a federation with women in the other Dominions of the Empire. The first Chapter of the I.O.D.E. was organized in the City Council Chamber of Fredericton, N.B., January 15, 1900, and their first project was to supply comforts to Canadian soldiers fighting in the Boer War.

One-Wheeled Carriage

A wag advertised a carriage to perform without horses, with only one wheel, and invited the curious to see it. Many of the members of the Society of Arts attended and, in the ardour of expectation, were shown a wheelbarrow.

Old Farmer's Almanac, 1946, p. 125

On the Rocks?

Several large stores in New York sell 100,000-year-old ice from Greenland for about two cents per gram (25 cents per ounce). They claim it to be glacial ice and much better than modern ice because it was formed before there was any unnatural pollution.

Conservation

In the 1950s soil conservation was one of the most popular bywords in agriculture. Agricultural Colleges offered courses in soil conservation and the theme of those courses could be found in such poems as:

Hordes of gullies oft
remind us
We should build our
lands to stay
And, departing leave
behind us
Fields that have not
washed away.
When our boys assume
the mortgage
On the land that's had
our toil
They'll not have to ask
the question:
"Here's the farm,
but where's
the soil?"

In recent times the concept of conservation has been broadened to such an extent that it is almost meaningless. Our newspapers and magazines tell us about the acid rain, smog, and all sorts of pollutants that foul up our environment, yet we hear people discussing environmental conservation as if we wanted to save it as it is. Certainly, efforts should be made to improve our environment, but let's not conserve it until it's much better than it is now.

Little Lamplighter

"Congratulations! I'll bet you find the new baby has brightened your home."

"It certainly has. We now have lights on almost every night."

Sugar Cured

When I was a child on a farm in New Brunswick, I fell and a rusty nail went through the flesh of my finger. My grandfather pulled my finger from the nail that was protruding from an old board, took me in the house, washed my finger in soapy water and then covered the wound with white sugar before carefully wrapping it with a clean cloth. I was reminded of that little episode when I read a clipping from *The Gazette* of December 15, 1982, which reported that Dr. Richard Knutson of the Delta Medical Centre, Greenville, Miss., had used sugar for more than seven years to treat hard-to-heal wounds, burns, and ulcers. He claimed to have seen an 80 per cent decrease in antibiotic usage and not had to do a skin graft in five years.

My grandfather's claims for the "healing power" of sugar may yet be amply justified. I can almost see him nod his head in approval.

The Quebec Act

When Canadians think of the Quebec Act of 1774, they usually think of that part of it which, among other clauses, permitted British criminal law and French civil law to be adopted in Quebec. When citizens of the United States think of the Quebec Act, they concern themselves with the part that arbitrarily extended the borders of Quebec southward to the Ohio River. This Act fed the discontent that led ultimately to the American Revolutionary War.

The Role of Aquaculture in Feeding the World

Part I

by J.S. Slinger
Professor Emeritus
Department of Nutrition
University of Guelph

Resources from the Ocean

Immediately after the second world war the world's fish catch was less than 20 million tonnes a year but annual growth of five per cent during the next 25 years brought this catch to about 70 million tonnes in 1971. This was faster than the growth in cereal production of 2.5 per cent or meat output of 2.0 per cent per annum during this period. Thus the seas seemed to hold the promise of being a panacea in feeding the world's hungry. However, in the past decade, the average growth rate of the world's oceans has been only about one per cent, reaching a plateau in 1982 and 1983 of about 77 million tonnes.[1]

While some 70 per cent of the earth's surface is covered by water, only in the portions of the oceans over the continental shelves and within the 200 meter depth range is fishing economically feasible. It is particularly at the margin of the seas (probably not more than three per cent of the ocean surface) that a great profusion of marine life exists. It is here that sufficient nutrient concentrations, washed off the land or upwelled from the remains of past generations from the depths, and dispersed by turbulence and convection and where abundant solar radiation reaches deep into the rich nutrient solutions, react to produce the organic matter needed for the start of most animal life in the sea.[2,3]

Dr. John H. Ryther, then a senior scientist in the Woods Hole Oceanographic Institution, concluded after 20 years of studying primary production in the oceans, that about 90 per cent of the ocean world is a "biological desert." He estimated a maximum sustainable yield from the seas of some 100 million tonnes per annum.[1,4] Much of the decline in the growth of world fishing can be attributed to overfishing, pollution, habitat disturbance, and improved technology in locating, catching, and processing fish in factory ships at sea.

The FAO maintains that overfishing would not matter too much if the fishing was more evenly spread. However, about 75 per cent of the world's total catch comes from just four areas, namely, the continental shelves of the North Atlantic and Pacific oceans, and the deeper currents off the coasts of West Africa and the Americas between California and Chile. The FAO points out that the declining rate of the world fishery during the last decade is mainly due to periodic collapses in the areas where yields previously grew the fastest. For example, the world's richest fishing ground — off the Peruvian coast, suffered a catastrophe in 1972-73, declining from 12 million tonnes of anchovies in 1970 to 4.4 million tonnes in 1972 and only 1.5 million tonnes in 1973. Overfishing was a factor in this disaster but the main reason was the appearance of a warm current "El Nino" flowing northward which caused the cold-water anchovies to scatter. The FAO recommends that greater use be made of the underexploited waters of the south-west Atlantic and Indian oceans which contain abundant stocks of excellent quality white fish. However, most underexploited species are the kind few people want to eat. For example, the tiny shrimp, Antartic krill, has guesstimated stocks of 50 million tonnes and is sometimes thought of as the next great hope for feeding the world's hungry. Squid is also greatly underfished and underutilized for a world short of food. However, fishermen are still hunters not farmers. Unlike farmers they do not practice good husbandry, choosing instead to use purse seine nets, scooping up even the young fish before they have had a chance to spawn. Fishing is an energy intensive industry which has suffered more than most by the OPEC-led increases in oil prices over the past decade thus making it more and more impractical to harvest unconventional species.

The New Law of the Sea

Sullivan[5] pointed out that the major argument of coastal states for the extension of their fishing limits was that fish stocks were being depleted through overfishing by foreign fleets. By 1977 most coastal states had unilaterally adopted the 200-mile limit to counteract the over-exploitation of their coastal stocks, thus giving it the

Dr. Stanley J. Slinger

Dr. S.J. Slinger, the most recent recipient of the Earle W. Crampton Award for distinguished service in nutrition, is Professor Emeritus of the Department of Nutrition in the College of Biological Science at the University of Guelph.

Born in New Lowell, Ontario, Dr. Slinger received his BSc from the Ontario Agricultural College, his MSc from the University of Toronto, and his PhD from Cornell University. From 1941 to 1965 he was in the Department of Poultry Science at OAC, and since 1965, he has been in the Department of Nutrition at Guelph, serving as Chairman from 1965 to 1974.

Dr. Slinger conducted research in several areas of poultry nutrition for more than 30 years. In 1972-73 a fish nutrition laboratory was set up, and this laboratory has continued to grow and improve ever since. One of the primary objectives in both poultry and fish nutrition research has been to develop feed formulas using feedstuffs of Canadian origin. These formulas have been published and continually revised and have been used extensively by feed manufacturers throughout Canada. Dr. Slinger continues to be active in research.

Dr. Slinger taught Poultry Nutrition in Poultry Science for 27 years, gave seminar courses in Nutrition and Physiology, taught "Fundamentals of Nutrition" in the Department of Nutrition, and he developed and taught courses in Fish and Wildlife Nutrition. He has supervised the work of many graduates, and it is interesting to note that

force of customary international law; these limits were incorporated into the Draft Convention when it was adopted five years later. OECD's Committee for Fisheries has recently reviewed the impact of the new regime on member countries' fisheries.

Under the 200-mile regime there has been a revival of fishing communities that depend on small cost-efficient inshore fishing craft. Canada's northern cod stock is being rebuilt to new rational levels which should provide increased catches for Canadian fishermen. However, the management problems in this area are minimal since the stock is wholly located within Canada's exclusive economic zone, and the Canadian catch has not had to be reduced. In most countries, the problem of overfishing has not yet been resolved because of difficulties associated with the allocation of joint stocks involving two or more countries. As an indication of the size of the problem 80 per cent of all the stocks in the north-east Atlantic are joint stocks, the main exceptions being those inhabiting Icelandic and Faroes grounds. Baltic cod represents a similar joint jurisdictional problem. Reduction of excess fleet capacity has been a particular difficulty in the fishing industry because it often affects fishermen with few alternate employment opportunities and small firms in single-industry towns. While stock rebuilding will be a slow, hard process, evidence indicates there will be replenishment of many overexploited and depleted stocks, much improved economic returns, and increased international trade.[5] It is of interest that Canada is the world's biggest exporter of fish, selling $1.6 billion-worth to foreign countries in 1983. More than half of Canada's exports go to the United States, the world's second biggest importer.[1] The United States now spends $4.5 billion a year on imported fish and exports $1.1 billion worth of its own but has ambitions to become self-sufficient in all but shrimp and exotic fish by the end of the decade.[1,6]

The 200 mile-regime was hailed as a victory for the poor countries, angry with factory ships from rich countries looting their resources; and while developing countries now land half the world's total catch, compared with 45 per cent in 1977, the two biggest beneficiaries of the 200-mile zones are not poor countries at all, but Canada and the United States.[1] Their 200-mile zones encompass the whole of the rich north-west Atlantic and north-eastern Pacific fish, and the International Court of Justice has recently divided the rich Georges Bank scallop grounds to the reasonable satisfaction of both sides.

If the average fish consumption of today is to be maintained with the present rate of population growth and the one per cent annual average increase in the world fishery of the past decade until the year 2000, then we are going to require a great increase in fish production — most logically from aquaculture. It is estimated that the demand for aquacultural products by the year 2000 will amount to 25 million tonnes.[7]

Aquaculture in North America

Canada's wild fisheries are in difficulties mainly because of an over-expanded, overcapitalized industry, an inconsistant quality product, and too high a price relative to red meat and poultry. The U.S. fishing industry is experiencing difficult times as well.[8] At the same time, the world demand for good quality fish and other aquatic products is increasing. Also, world out-

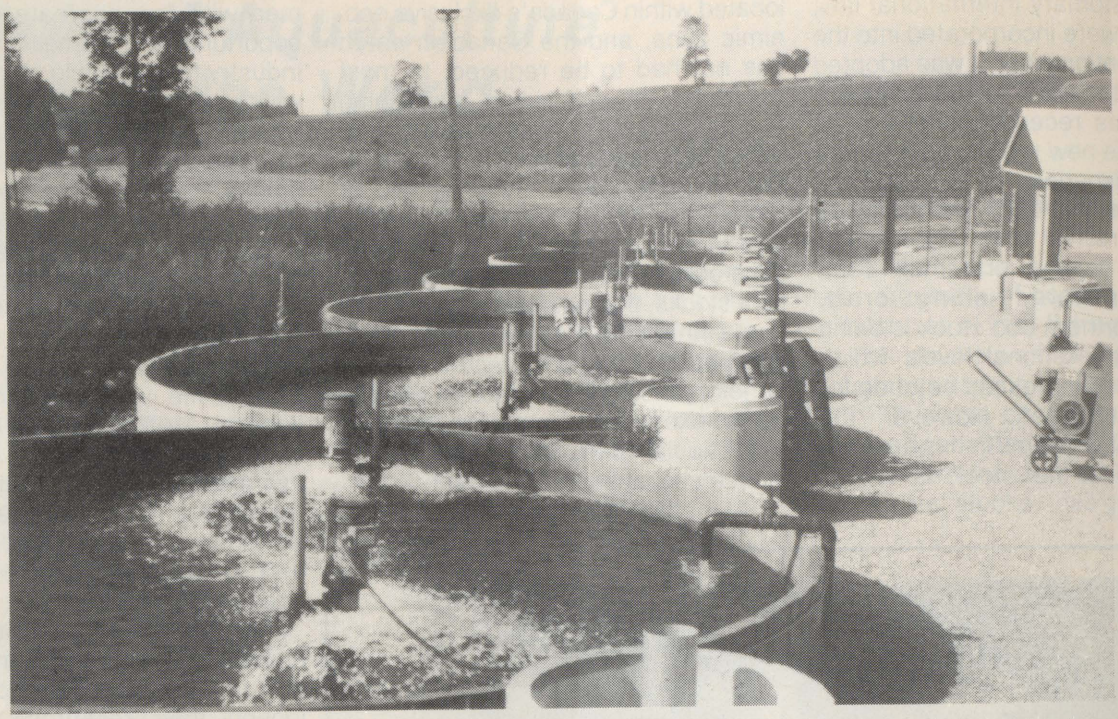
Dr. S.J. Slinger received the Earle W. Crampton Shield from Dr. L.E. Lloyd just prior to presenting his lecture on aquaculture.

he Nutrition Department at Guelph is he only department in Canada — and here are very few in the United States – turning out graduates in Fish Nutri-on at the PhD level.

Dr. Slinger has been the author or co-author of over 300 scientific papers. He has served on many committees of he Poultry Science Association, the Agricultural Institute of Canada, and he Canadian Committee on Animal Nutrition and Nutrition Society of Canada. He travelled extensively hroughout the world for the past 30 ears as a consultant to Shaver Poultry Breeding Farms, Cambridge, Ont. He as helped to establish modern poultry ndustries in such countries as Mexico nd such areas as South East Asia, frica, the Middle East, Eastern and Western Europe, and the United King-om. Lectures, conferences, and other onsultative work have also taken him o many countries over the years.

The recipient of numerous honours and awards, Dr. Slinger was made Professor Emeritus of the University of Guelph in 1980. He received the Earle W. Crampton award on November 7, 1984, at Macdonald College. This award is given by the Faculty of Agriculture in recognition of significant contributions in the field of nutrition through research and/or service. The award is named for Dr. Earle W. Crampton, a renowned nutritionist whose career at Macdonald began in 1922 and lasted for 51 years. We are pleased to be able to publish Dr. Slinger's Crampton Lecture "The Role of Aquaculture in Feeding the World." Because of its length, we are dividing this lecture in two, Part II will be printed in the August issue.

(Note: A List of References is available on request to Hazel M. Clarke, Editor, Macdonald Journal.)



A series of circular concrete tanks, with airators, on an Ontario trout farm. This farm uses artesian well water.

put from aquaculture has increased rapidly in recent years and will amount to an estimated 10 million tonnes in 1984, representing more than 10 per cent of the world harvest of fishery products. This share will increase steadily since aquacultural activities are often the only way to increase the output of fishery products for which there is a demand.[9]

Rainbow trout and channel catfish comprise over 90 per cent of the fish cultured in North America. The major reason for the dependence on these two species of fish is that there are readily available markets for them as well as reasonably good working knowledge of the culture methods involved in their breeding and rearing, and strains are available which have been domesticated for many years. Other salmonids being reared in Canada for enhancement of our fishery stocks for commercial fisheries and anglers, as well as for direct table use, include Pacific salmon, Atlantic salmon, charr, and sea going brook trout. One of the more important types of aquaculture in North America has been sea ranching or ocean farming. The cost of raising juveniles in hatcheries is relatively small while it costs much more to raise them from juveniles to adults considering feed costs, labour, and facilities. While the most common sea ranching animal is salmon on both the North Atlantic and Pacific coasts, Dr. Robert J. Naiman and co-workers at Woods Hole and the Oceanographic Institution's personnel at the Matamek Research Station in Quebec have been working on a promising new candidate for sea ranching, namely, the sea going brook trout. Sea-run brook trout have shown growth rates four to five times that of brook trout remaining in fresh water. This, in combination with a very high rate of return to parent streams, has generated keen interest in the use of this species in fish farming, ranching, and population enhancement. Averaged over two years, 34 per cent of the tagged fish were recaptured with the best returns in the two- and three-year-old fish. In contrast, tagged Atlantic salmon smolts leaving the Matamek typically yield returns of only one per cent. In addition to salmonids there are also numerous other finfish and shellfish species and some species of marine plants in various stages of commercial development in Canada.[4,9]

Canada has abundant aquatic resources, both salt and fresh water, which are much more than adequate to support our relatively small aquaculture output of about 6,000 tonnes per annum worth $16 million. The short-to-medium term potential for all aquacultural production in Canada is projected to be worth several hundred million dollars annually, creating new wealth and being an important source of employment for many of Canada's small communities. Canada's expertise in fisheries research and technology is outstanding. It therefore remains for Canada to utilize the unique Canadian environment to the maximum benefit of the people, at the same time keeping in mind the ecological constraints and marketing strategies which now support economically viable aquaculture industries in other parts of the world.[9]

According to Stucker and Lipton,[10] aquaculture in the United States in 1982 produced almost 400 million pounds or about 11 per cent of total edible fish and shellfish production in that country and was valued at about $400 million. Output was 208 per cent greater than the 130 million pounds grown in 1975. Farm production of catfish in 1983 amounted to 220 million pounds (100,000 tonnes). Much of this expansion has occurred in the last three years, as 1983's total soared 187 per cent above the 76.7 million pounds produced in 1980. Practically all the freshwater trout marketed in the U.S. are aquaculturally grown and amounted to 48 million pounds with a

value of $48 million in 1982. Aquaculture also produces most U.S. crayfish with production rising steadily. Forty per cent of the U.S. supply of oysters is also culturally grown. In 1982 the production of cultured oysters totalled 21.7 million pounds valued at $34 million. Other cultivated saltwater species in the U.S. include salmon, hard clams, shrimp, mussels, and abalone. Of these salmon is the largest with production of foodsize salmon in 1982 estimated at 25.5 million pounds. There is some evidence that shrimp and lobster production have good potential in future U.S. aquaculture production.[6]

The future of aquaculture in the U.S. looks bright. Since 1960, increases in disposable income have contributed to a 25 per cent rise in consumption of red meats, poultry, and fish with fish consumption rising by two pounds per person per year since 1962. Much of this increase is accounted for by food eaten away from home where about two-thirds of the fish and shellfish sales occur. While demand will likely continue to increase in the future, the available wild supply of traditional species is more likely to decline on a per capita basis.[10]

Aquaculture in Europe

Only in the last 20 years has the intensive aquaculture of marine and freshwater species been developed into a viable industry in Europe. Today in European fishmarkets, all the rainbow trout, most of the salmon, mussels, and oysters and some of the eel, turbot, dover sole, freshwater crayfish, prawns, and mullet are products of intensive aquaculture. That is, these species are reared through their entire life and harvested under farming conditions.[11]

Commercial trout farming first started in Denmark around 1890 and as far back as 1970 there were more than 600 trout farms on the rivers, mainly in Jutland. At the present time, however, France is the number one producer of farmed trout in Europe, followed by Denmark, Italy, and West Germany, in that order. Western European production in 1983 was about 110,000 tonnes.

Production of rainbow trout and salmon has been growing rapidly during the past several years with Norway leading the way by a large margin. The Norwegian fjords are blessed by the gulf stream and have pioneered in cage culture. The western coasts of Scotland and Ireland as well as the Faroe Islands provide environments similar to the Norwegian fjords with mild winter temperatures, cool summers, and adequate depth and circulation. Thus salmon farming is expanding in these areas but is far behind Norwegian production of some 16,000 tonnes in 1983 out of a total of about 19,500 tonnes.[11]

Eel farming is also well established in Europe and nuclear power station as well as fossil fuel thermal station effluents are used in Scotland and England. There are now a number of specialized companies collecting elvers along the western European coast which are being supplied to farmers in Europe as well as Japan and Taiwan.

France is the European leader in oyster production (100,000 tonnes per year) while mussel culture, also extensive in France, is exceeded by the 120,000 tonnes annual production of The Netherlands and the 200,000 tonnes production in Spain, mostly produced on ropes hanging from rafts.[11]

Aquaculture in Other Countries

More than one-third of the cultured products of the world are finfish raised by about a dozen countries of Southeast Asia and the Pacific. Most of this production is various species of carp and tilapia raised in freshwater ponds, and mullet and milkfish raised in saltwater ponds along coastal areas. Asia has a long tradition of aquaculture and accounts for much of the world's production. In 1975 Asia produced five million tonnes of culturally grown fish and seafood, 83 per cent of the total. This included aquatic plants, though, which serve as an important source of food in many Asian countries. More than one million tonnes are produced annually through aquaculture in China, Japan, and Korea; seaweed is also grown extensively in tropical waters around Singapore, the Philippines, and elsewhere. Freshwater cultured fish in Japan include trout, carp, and ayu, a species native to Japan. Japanese saltwater culture production reached 990,000 tons in 1980, with about 512,000 tons attributable to seaweeds. Shellfish production totalled 310,000 tons and fish 170,000 tons in 1980.[10]

Interestingly, while Japan lost more than any other country by imposition of the 200-mile limit, they are still the world's largest fishing nation and the world's largest fish importer. In 1933 Japan imported 24 per cent by value (1 million tonnes, worth $3.8 billion) of the world's fish trade and Japanese ships landed another 10.8 million tonnes, as much as the whole western European catch. Each Japanese eats, on average, more than 40 kg of fish per annum.[1]

As important as aquaculture is in Japan, it is much less significant than in China on the basis of need and total production. Pillary visited China in 1975 and ranked China first in aquaculture production with an estimated yield of 2.5 million tonnes or 40 per cent of the total estimated world aquaculture production at that time.[12] A more recent (1984) estimate[13] indicated that China's freshwater farm pond harvest increased to a record 5.3 million tonnes in 1983, which is an increase of over 80 per cent compared with the 1980 harvest. By 1985, China expects to have added another 28 per cent and 20 per cent, respectively, in land and marine farm water areas. Marine farm production is expected to top 550,000 tonnes. The farming of freshwater fish in China was one conducted mainly in the southern part of the country but has spread to the Sanbei region of the north during the past four years. Only 40 per cent of the water areas suitable for fish farming in the north are currently being utilized and the potential for increasing production in the area is extremely great. Thus farmed fish production in China is greater than the rest of the world combined but is still growing rapidly. Other important aquacultural nations include Ecuador, the world's largest producer of culturally grown shrimp, Taiwan, Israel, Indonesia, and the Philippines. Estimates indicate that culturing accounted for between eight and 40 per cent of the total fish production in these countries.[10]

There is considerable aquacultural production in many other countries of the world while there is the potential for such production in almost all countries whether coastal or land-locked.

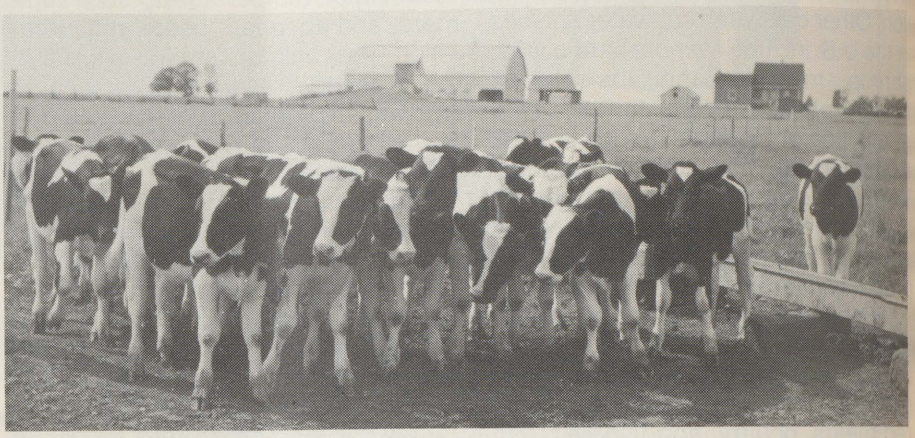
Part II of "The Role of Aquaculture in Feeding the World" will be publishing in the August Journal.

The role of nutrition in attaining maximum milk production potential from replacement heifers

Part II Weaning to pre-freshening

by Professor Elliot Block
Department of Animal Science

Part I "Prenatal nutrition to weaning" was published in the February issue of the *Macdonald Journal*.



B. Weaning to six months

Between weaning and six months you should want your heifers to grow well without getting fat and to complete ruminal development. For the first six months these heifers should receive fine-stemmed pliable hay of fairly high quality to maintain high levels of forage intake. Silages of **very** high quality may be used to furnish the entire forage component of these heifers' rations. However, keep in mind that these animals may not have a fully developed rumen and would be very sensitive to silages that have not fermented properly or are of low quality. Therefore if you have any doubts as to the quality of your silages, limit these to 50 per cent of the forage dry matter. High quality pasture can be utilized after weaning if other forages and concentrates are available. All hays and haylages can be offered free-choice, but they must be kept fresh and free of manure contamination. The recommendations for feeding corn silage are the same except that the amount fed may have to be limited if your heifers are gaining weight too fast due to the high energy content of corn silage. The total forage dry matter intake should be 0.9 to 1.8 per cent of body weight daily after weaning.

Some farmers prefer to offer their animals total mixed, or complete, rations. This is where forages and grains are mixed in proportions creating a balanced ration. If the forage portion of the ration is finely ground or pelleted, then some long hay (.5 kg) should be offered to animals daily to ensure proper rumen development. Again, your dairy grain mix can be used as the grain portion provided nutrient requirements are met. Table 9 contains the nutrient specifications for heifers along with expected dry matter intakes.

One last point for animals in this age group is water quality. Water is seldom considered in dairy management yet if quality of water is poor animals will not perform well even if offered a "perfect" ration. Acidic or alkaline water disturbs rumen function and, therefore, affects digestibility of feed; water polluted with heavy metals will upset an animal's mineral balance; water polluted with bacteria will cause calf scours and decreased disease resistance. Table 10 contains the approximate water intake of calves. Check these intakes occasionally and if problems seem to exist, have your water tested.

C. Six months to pre-freshening

At this point in the heifer's life a balanced ration is easy to obtain. In fact, after nine months a ration of 100 per cent forage can be given successfully. The biggest problem during this time is trying to prevent heifers from getting fat. As we will discuss later, fat heifers will not be able to produce as much milk as they would have if thinner, even if they lose the extra weight

Table 9. Suggested specifications for complete rations for dairy young stock on a dry matter basis

	Age, months		
	0-6	7-11	12-24[a]
Crude protein, minimum (%)	16.0	12.0	12.0
TDN, minimum (%)	68.0	64.0	62.0
Calcium (%)[b]	.48	.42	.42
Phosphorus (%)	.32	.28	.28
Magnesium (%)	.22	.22	.22
Sulfur (%)	.22	.22	22
Potassium (%)	.80	.80	.80
Iron (ppm)	100	100	100
Copper (ppm)	11	11	11
Manganese (ppm)	44	44	44
Zinc (ppm)	70	70	70
Salt (%)	.25	.25	.25
Cobalt (ppm)	1	1	1
Iodine (ppm)	2	2	2
Selenium (ppm)	.08	.08	.08
Vitamin A, IU/day	20000	20000	20000
Vitamin D, IU/day	4000	4000	4000
Vitamin E, IU/day	20	20	20
Concentrate dry matter (%)[c]	65	25	15
Dry matter intake (% body weight)	2.6	2.2	2.2
Body weight for program, kg[d]	153	344	450

[a]Limit silage and high protein forage 4 weeks before calving
[b]Calcium should be 1.5–2.5 times the level of phosphorus
[c]Remainder of ration from forage or roughage dry matter
[d]Body weight assumed in ration formulation

n lactation.

The forage dry matter intake during his period should be 2 to 2.2 per cent of body weight daily. All types of orages can be used, including asture. The supplementation of orages and pasture is largely depen- dent upon the initial forage quality. Forages with greater than 65 per cent TDN will require no additional grain; 60-65 per cent TDN forages will require 0.5-1.5 kg grain supplemented per day; forages with less than 60 per cent TDN will require 2-3.5 kg of grain supplemented per day. Since the higher quality grass hays (i.e., timothy) will contain 62-68 per cent TDN and 10-12 per cent protein, a ration of this hay plus salt, vitamins, and minerals will be adequate in most cases. High quality legume hays need not be fed to these animals. High quality legumes contain too much protein which is wasted in heifers. Most often a mixture of average grass and legume hay (or haylage) is adequate. A problem can arise when feeding corn silage which is low in protein and high in energy. If heifers are allowed free access to corn silage, they will get fat; therefore, when offering corn silage you may have to limit the amounts given to heifers. When corn silage is part of a heifer's diet you must be sure that the ration is balanced for protein and, again, if the total ration has greater than 60-64 per cent TDN, you will have to limit the amounts offered to heifers. In all cases be sure that salt, vitamins, and minerals are balanced.

For complete rations any forage(s) can be used but again use caution with high energy forages. Be certain that the smaller heifers have an opportunity to eat and are not crowded out by the larger heifers. Split your heifers into groups when necessary to facilitate adequate intake. Table 9 contains the nutrient specifications for rations.

If grain needs to be supplemented, you can use dry or high moisture grains as these animals should be able to fully utilize high moisture feeds. In this regard you may want to consider that the fat-heifer problem created by feeding high levels of corn silage exists because corn silage is 40-50 per cent corn grain on a dry basis.

As a final feeding recommendation, just prior to freshening it is advisable to give heifers a ration that contains similar ingredients to the ration that will be fed after calving. This will accustom the heifer to the types of feeds fed later. Do not feed a lactating-cow ration as this will cause overconsumption of protein and energy. If NPN (urea) is included in your rations for lactating cows, then you must begin to include NPN in heifer rations at six to nine months and maintain this NPN feeding through freshening. The rumen adapts to NPN, which allows us to feed it to cows to increase the protein level in rations. This adaptation reverses if the NPN is taken out of the ration. Therefore, if heifers that did not receive NPN before calving are given NPN after calving, they will not be able to use the NPN as protein for two to three weeks and, therefore, are not really getting the level of protein in the diet that you assume.

As some nutritional guidelines, Tables 11 and 12 can be used. Table 11 illustrates the nutrients required to be supplemented with various forage feeding programs, while Table 12 shows a general summary of forage and grain intakes for heifers of various ages. These are guidelines and are highly dependent on forage quality.

See August Journal for Part III "Heifer Nutrition and Growth."

Table 10. Expected water intake after weaning (Holstein)

Age, months	Water intake, litres/day[a]
1	5.0 – 7.5
2	5.5 – 9.0
3	7.5 – 10.5
4	11.5 – 13.0
5	14.5 – 17.5
15 – 18	22.5 – 27.0
18 – 24	27.5 – 36.0
Dry cow)	(34.0 – 50)
Milking cow)	(4.5 – 5.0/litre milk produced)

Intake depends on water content of forage ration. Higher levels apply to all hay ration, lower evels to all silage ration.

Table 11. Guidelines on grain and concentrate supplementation required for heifers older than 6 months fed various forages.[a]

Nutrients required in supplement	Forage Ration			
	Legume	50:50[b]	Grass	Corn silage
Crude protein (%)[c]	8 – 10	10 –12	16 – 18	24 – 32
TDN, minimum (%)	70	68	70	65
Calcium (%)	.06	.18	1.0	1.2
Phosphorus (%)	.70	.35	.45	.51
Magnesium (%)	.17	.25	.30	.35
Sulfur (%)	.16	.25	.40	.50
Potassium (%)	.50	.50	.60	.70
Trace mineralized salt (%)	1.0	1.0	1.0	1.2
Selenium (ppm)	.3 – .4	.3 – 1.0	.3 – .4	.3 – .4
Vitamin A (x 1000 IU/kg)	11	11	11	11
Vitamin D (x 1000 IU/kg)	2.2	2.2	2.2	2.2
Vitamin E (x 1000 IU/kg)	11	11	11	11
Daily concentrate fed (kg)	2 – 3	1.5 – 2.5	2 – 3	1 – 2

Assumes dry matter intake of forage at 2% of body weight
Assumes 50% dry matter from legume forage and 50% from corn silage
Use the higher levels at the lower intakes of concentrates

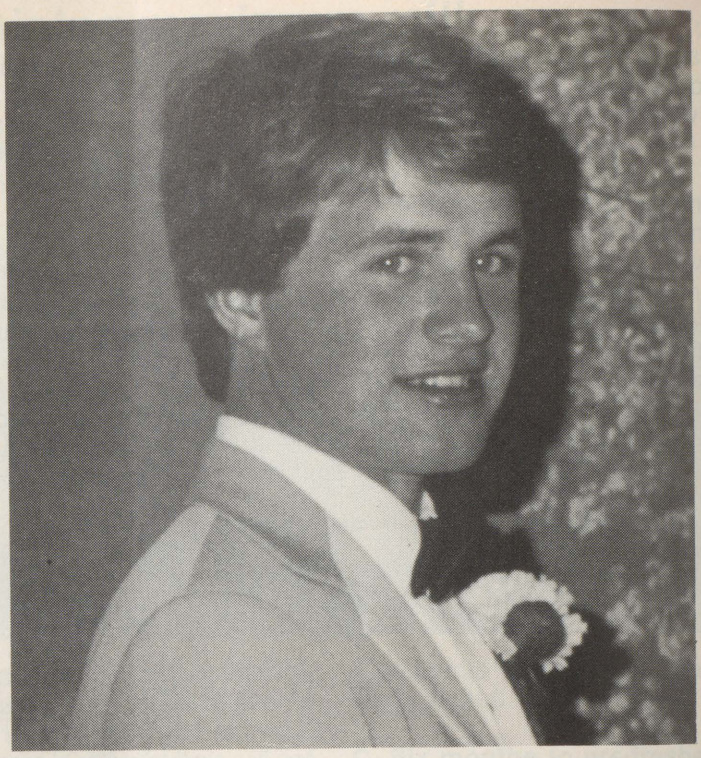
Table 12. Dry matter intake and percentage of dry matter from forage and grain necessary to provide adequate growth rates for dairy heifers

Age months)	Body weight (kg)	Total dry matter intake (kg/day)	Forage: grain ratio	CP %	TDN %
o weaning[a]	55	.45– .9	0:100	15–18	75
veaning to 2	69	1.8–2.2	25:75	15	70–75
3	100	2.6–3.1	50:50	14	66–68
6	173	4.4–4.8	67:33		
9	240	6.1–6.9	75:25	12	65
12	313	6.9–7.7	75:25		
15	380	7.7–8.5	100:0		
18	452	8.5–9.3	100:0	12	60–65
21	521	7.7–9.3	100:0		
24[b]	581	7.7–8.5	80:20	12	62–65

Does not include milk or replacer
Expected calving at 24 months of age

DIPLOMA CORNER

by Jim Currie
Assistant Director
Farm Practice
Diploma in Agriculture
Program



Kevin McDonell

"Good things come in small packages" is an old saying that we have all heard and used often. It's a ploy to cover up why little Johnny got a smaller Christmas gift than little Suzy; it has been used to introduce a diamond ring to a prospective mate, and it is often used to make small people feel better about their size. The saying may not always be accurate, but there are two brothers who have taken the Diploma Program lately who fit the bill exactly.

Kevin (Dip '82) and Leighton (Dip '85) McDonell are two students that will always come to mind as being examples of why we have a program at all. They came to the program knowing that they wanted to be farmers and that this was a necessary step toward that goal. Kevin was born to be a farmer, so he took the Diploma Program right after high school and then went straight back to the farm. Leighton, on the other hand, dabbled in farming, then tried other possibilities for a while. He completed a Degree in History, then worked at home on the farm while Kevin did his diploma. During this time they decided to farm together, and to do that they had to get bigger and more efficient. As far as they were concerned this meant that Leighton would also take the Diploma Program. Kevin and their father planned to take care of the farm while Leighton was away. Everything was going as planned; the two boys, with their father's support, were building the farm toward their goals when on January 31, 1985, an accident on the farm took Kevin's life. This article, then, is a tribute to him.

Kevin was born March 9, 1962, into a farm family that would eventually include two other brothers and five sisters. His father, Raymond, farmed about 240 acres and milked about 35 cows at that time. During his formative years there were three main factors that influenced his development. His parents, first and foremost, instilled in him a Scottish work ethic that made him ambitious, yet realistic. The Catholic Church helped establish his moral principles. Unlike many people his age, he respected the Church and, when possible, participated in its activities. And finally his friends helped him grow. As he matured he was involved in many community activities. He was head of the students' council in his final year at high school and was an active sportsman. Besides hockey and touch football, he played soccer in the local community league. As a Diploma student he continued this interest in sports and acted as sports director for his class. He was also a tough little hockey player, short enough that he was impossible to knock over, yet, when checking, he would catch an opponent just about at the knees.

Kevin was not necessarily a perfect student. He was a great class member, an active member of the group, and mature enough to be a friend of many staff members. According to his classmates, he really enjoyed almost all parts of student life, except cooking for himself. He never did learn how to cook. He readily joined in student activities and, because of his personality, usually carried the group with him. Some of the talents that he explored while he was a student served him well later at home. He joined in the "Royal" livestock show in his first year to learn a bit of showmanship. He eventually would help some of the local breeders at county fairs. In his second year he was the MC of the livestock show. His quick wit and sense of humour kept the audience involved all day long at the arena. So much so that he was invited back the next year.

Soon after he graduated he was invited to speak to the local Ayrshire breeders' association. Since he was a Holstein man, this invitation was obviously based on his personality, speaking ability, and his experience. In that speech he demonstrated his high regard for a college education (experience) for young farmers when he said, "The chance to get away helps mature you because there is no one there to tell you what to do. You learn to do things for yourself and where I went the toughest thing was cooking. Your college education broadens your mind by learning how other people do things and what other people are like. However, the greatest thing about a college education is the confidence it instills in you that you can go home now and do a job your own way."

He believed so strongly in the Diploma Program that when his older brother, Leighton, decided to join him on the farm, Kevin talked him into attending Macdonald first. They began

to work and plan toward a shared farming enterprise with Leighton handling the field work while Kevin managed the herd. To do this and to handle the possibility of three families living off the farm, Leighton and his father bought an uncle's farm, the ancestral family farm, in North Lancaster, Ontario. The two farms were close together and could easily be worked as one unit, now comprising almost 400 acres.

Even though Leighton was still in school, the boys were already advancing on their plans. They had been able to reduce the herd size by increasing production. They had also started doing some cash cropping of corn, and were looking at soybeans as a rotation crop. In all of this Leighton points to his father as a stabilizing force. The brothers would make their plans, then approach their father, who would support them to the limit as long as they had looked at all aspects of their plans. This third opinion is a factor that will be greatly missed now that Kevin is no longer there.

Kevin will be missed in the community as well. He was an active member, participating in many local associations and activities. He had already become a member of the Glengarry County Milk Committee, the Ontario Milk Recording Committee, and the Holstein Association. His love of sports showed through his position on the Board of Directors of the local soccer league. And his respect for the Church continued through his membership on the parish council. The admiration that he generated in all the people that he touched can best be demonstrated by the number of people who paid their last respects at the funeral. His life was properly described by one of the priests at the church when he drew an analogy between Kevin's life and a full container. He said that the size of the container doesn't matter. It could be as big as a barrel or as small as a thimble, but when it's full, it's full.

As far as Leighton is concerned, the farm and his family are still there. There's a difference, but the goals remain. There is a possibility that his younger brother might join him on the farm but, according to Leighton, that is a decision that his brother will have to make by himself. Even if he does decide to join in the farm enterprise, Leighton figures he has a few years to go to finish school and probably an agricultural college program.

ARBORETUM FALL FIELD DAY

by Professor A.R.C. Jones
Woodland Resources
Department of Renewable Resources

On November 24th the Arboretum Association held its annual sale of handicrafts and field demonstrations of small forest equipment at the Conservation Centre. The Field Day also opened the annual Christmas tree, evergreen boughs, and maple syrup sale — a popular event for members of the Association and for the management as it brings in important revenues to help pay for the operation of the property. This year the sale of handicrafts featured yule logs, pressed plant hasti-notes, lampshades and candles decorated with pressed plants, log carriers, and pine cone wreaths, all products of the volunteer's handicraft program which meets each Wednesday morning in the Conservation Centre. None of the natural products used in the handicrafts are collected in the Arboretum. This year 25 pine cone wreaths were a popular item and sold almost as quicly as the plantation-grown Balsam fir Christmas trees which are grown in southern Quebec.

The woodlot equipment show started with a demonstration of the safe use of chainsaws and brushcutters by Homelite, assorted pruning, cutting and forestry tools from Caverhill-Learmont and Hakmet. Hakmet also demonstrated its Scandinavian line of loading booms and skidding grapples which attach to a farm tractor-trailer combination that can handle most farm forestry jobs. The Arboretum's agri-winch and Forcom wood splitter were demonstrated in use. A new log moving device called the Porta-Log, sold by Mancine, showed how sawlogs or long-length fuelwood material can be moved from stump to roadside for small woods operation. The Porta-Log is a form of sulky mounted on wheels but for $180 can be equipped with skis for winter use and is easily attached to tractor or snowmobile for woods extraction. Stinson equipment demonstrated the value of explosion-proof containers for storing gas and oil using a video-cassette viewer. The cooperation of these firms and all the hard work of the Arboretum volunteers and staff in making this field day and sale a success is gratefully acknowledged.

During the Arboretum Field Day demonstrations were given on the use of Hakmet's grapple loader and trailer used for the transport of wood products from stump to roadside or mill.

A Touching Experience

by Shiona Dempster, BSc (Agr) '84*

This past summer I had the opportunity to work on a project called "The Wildlife Experience," or "The Petting Zoo." It was funded by the federal government under the Summer Canada Works Program and designed to give the public, especially children, a chance to see and touch some of the wild inhabitants of our region in a controlled, natural setting.

A Land Planning and Environmental Conservation student Don Houston, who is now in his third year, created the idea of a petting zoo under the direction of Professor Roger Titman, Chairman of the Department of Renewable Resources and Professor Roger Bider, a wildlife biologist. Once approved, the project received a grant of $8,300 which provided funds for construction as well as wages for Don, Mark Gloutney, at present a second-year Wildlife student, and myself (my major was Wildlife Resources).

Don Houston was our project coordinator and dealt with public relations and scheduling tours. Just prior to our opening day, we received front-page coverage in the West Island section of the *Gazette* as well as an article in the local *News and Chronicle.* We also had an information sheet which was distributed to recreation centres on the Montreal Island informing them of our free services, how they could get in touch with us, where we were located, and so on.

The zoo site itself was an open field some 0.3 km^2, situated in the southwestern corner of the Wildlife research area in the Stoneycroft Pond Pasture. The first five weeks of the summer were spent putting the program together: brush was cleared, grass was whippersnapped, habits of the animals were researched, interesting ways in which to present information to the children were devised, teaching aids assembled and, finally, enclosures were constructed to house the various critters.

Shiona Dempster, above, and Mark Gloutney, below, share the children's thrill and fascination with the wild inhabitants of the petting zoo.

We had an aviary where we housed three common crows, three cottontail rabbits, and three painted turtles complete with wading pool. It was simple construction — we erected poles and covered them with top flight netting. The aviary was large enough to allow the birds to fly and bring a tour group inside. Raccoons were billeted in an open pen made of sheet metal which was under the shade of an old elm tree. Needless to say, this material did not prevent them from devising methods of escape. Groundhogs occasionally starred in a tour if they appeared, by chance, at their entrances as we passed by.

Our open-air office, which also served as a weather shelter, consisted of more poles over which a tarpaulin was stretched. Here we housed, in aquaria, garter, milk, brown, and red-bellied snakes as well as red-spotted newts, blue-spotted salamanders,

***Last February Shiona started a Master's degree program with the Institute of Parasitology which is located on the Macdonald campus.**

wood frogs, common green tree frogs, and American toads.

We operated a phone-in service for local wildlife-related problems such as what to do with troublesome raccoons or how to help baby birds that had fallen from the nest. It was through this service as well as the S.P.C.A. in Montreal that we acquired our raccoons and rabbits. The crows were raised in captivity from birth and donated by the Wildlife section along with the turtles. The amphibians and reptiles originated from nearby Ile Perrot.

Tours started on July 11 and ran until August 21, except for the weekends. Each tour lasted between one and two hours and no two tours were ever alike. Each visiting group asked different questions and there were always new stories to tell about the adventures of Rocky, Honey, and Bandit, some of the raccoons, as well as Fric, Frac, and Froc, the crows. We found the ideal group to be 15 participants but sizes ranged from one to 45. Our youngest visitor was three-week old, but she was concerned with matters of greater importance as she slept through the whole tour. I hope that was no reflection on the tour guide!

We created nature games to illustrate various points in our talks. The food web game, for example, consisted of assigning different roles to the children — predator or prey. Their interdependence was shown by attaching one to another with string. If one predator was removed, all the connecting strings were pulled, demonstrating the way in which a disturbance can spread through the ecosystem.

The majority of our visitors were groups of children from summer parks programs operating in the communities throughout the Island. Families, neighbourhood groups, and associations such as the Quebec Young Farmers were also frequent visitors. People came from places as far away as Fort McMurray, Alberta, and San Francisco, California. With the Morgan Arboretum, the Raptor Research Centre, and the college farm all close by, many groups were able to spend a full day at Macdonald.

I found it thrilling and pleasurable to see the amazement on the children's faces as the painted turtle would pull its head back into its protective shell and then peak out a few minutes later. Parents were quite surprised at how smooth and "unslimy" a garter snake was to touch as many exclaimed, "I never thought I would touch a snake!" The job was also an opportunity for the three of us to gain experience in wildlife interpretation, thus putting to full use the communication skills we had acquired in class.

With a grand total of more than 1,400 visitors, the Wildlife experience closed at the end of August. The snakes were released in the Wildlife area along with the frogs, salamanders, and newts. The raccoons were given to a graduate student in Wildlife who is studying these animals at present. The crows were set free. Unfortunately, the rabbits met their maker when some predator entered their pen and had them for dinner mid-way through the summer.

Many people asked us if the zoo would be re-opening this summer. As I write this, that question remains to be answered, but it certainly would be a most worthwhile project, worthy of repeating in my opinion.

Guelph—Macdonald Study

Are Canada's salad days here again?

If it's 20 below and the snow is up to our necks, but we still want the makings for a Caesar salad every day, then Canada's agricultural and import policies may have to change over the coming years. What vegetables do Canadians prefer to eat, which ones do they actually buy, and how are they used? Early in 1984 Agriculture Canada funded a survey to find out the vegetable eating habits of Canadians: it was a team effort with Professors Trevor Watts and John Liefeld of the Department of Consumer Studies at the University of Guelph and Professor Shirley Weber of the School of Food Science at Macdonald. The Ontario surveys were conducted in Ottawa, Hamilton, and Oshawa, the Quebec ones in Montreal, Quebec City, and Trois Rivières.

The 10 preferred vegetables included broccoli, turnips, beans, cabbage, and cauliflower. What 10 vegetables were eaten most often? Potatoes in all forms — mashed, fried, baked — led the way. The other top vegetables in order were lettuce, carrots, tomatoes, onions, vegetables in soup, green peas, corn, celery,and vegetables cooked with meat, i.e., stews and casseroles.

Missing from the shopping list are what many people think of as traditional winter vegetables: turnips, cabbage, beets, and squash. Although there are no comparable data, it was felt that vegetable eating habits are changing. Professor Watts from Guelph noted that more salads are being eaten and that younger people, in particular, are trying different vegetables such as broccoli, mushrooms, eggplant, okra, and zucchini, although he added that they are eating a smaller variety of vegetables.

The survey indicated that consumers prefer buying fresh vegetables. By purchase instance, Canadians purchase 70 per cent fresh, 23 per cent canned, bottled, or in jars, 6.6 per cent frozen, and the rest dried. When buying fresh vegetables, the appearance and the freshness of the vegetable were important and consumers were more price tolerant; price and ease of preparation were more important when buying canned and frozen vegetables, and nutrition was important in all purchase decisions.

Professor Weber hopes the level of interest shown by the participants in the study is indicative of that of the general public. "An understanding of the food-nutrient connection is so fundamental to the fashioning of a healthful lifestyle," she pointed out.

Raw vegetables were important in both Ontario and Quebec and when it came to cooking, boiling was the method used most though more Quebecers boiled their vegetables than those in Ontario, where baking, steaming, frying, and microwave cooking were more common.

The team would like to see follow-up studies done on summer vegetable purchasing and eating habits.

P.S.

Well-Balanced and Readable

I wish to renew my subscription to the Macdonald Journal. There are always articles in it which I enjoy, and in the February issue I found the story of the Nesses particularly interesting. The article by Jim Currie on the "New and Improved Diploma Program" was most informative and well written.

When a new issue arrives I look first of all for Ralph Estey's page and marvel at the blend of erudition, humour, and trivia it contains.

Congratulations on a well-balanced and readable publication.

Gordon McElroy,
Baie d'Urfé, Que.

(Editor's Note: Word-of-mouth reaction so far to the articles on the Ness family which were published in the May issue of the Journal has been most encouraging and, thanks to Mildred (Ness) Irwin, Teachers' 41, we have two more names to add to the list of "Nesses and Macdonald College." Robert R. and Professor Alex Ness's brother Albert had a son Alvin who was in the Dip Class of '41. His studies were interrupted by World War II in which he was, regrettably, killed. Mrs. Irvin also added her daughter Anne to the list as she was in Physical Education' 68. That brings the number up to 32!)

Like Mother's Apple Pie!

I received the November issue of the Macdonald Journal with joy and pride. It was like tasting mother's delicious apple pie upon returning from a long journey. The enthusiasm and well-managed aggressiveness of the Institution as a whole is apparent in the Journal and a comforting thought.

The format and the material made the Journal pleasant and informative. I think it could take an additional dose of scientific communications to inform the community at large of the quality and the quantity of research work conducted at Mac.

You now have a good nucleus of trustworthy sponsors. What remains to be done to help the Journal is to increase the circulation. I have to do my share in two different ways concerning this aspect. First, I include a cheque to cover five one-year subscriptions, each one to be offered as a gift to the five students who have made the best presentation of their third-year project in the Department of Renewable Resources. I intend to carry on with this offer for as long as I live or Macdonald lives, whichever comes first! Second, I wish to pay for 30 subscriptions during a trial period of five years for high schools that do not already receive the Journal.

(Professor) Gerry Millette
Abidjam, Cote d'Ivoire.

(Editor's Note) Dr. Millette, BSc (Agr) '45, MSc (agr) '48, retired last year from the Department of Renewable Resources and is at present working as an Expert Consultant on the Ivory Coast on a World Bank contract administered by CEGIR Co. of Montreal. We greatly appreciate both his kind comments and his generosity. See photo inside back cover for project winners.)

Memories of Canada

I was very pleased to get the February issue of the Macdonald Journal. This Journal reminds me of my pleasant life at Macdonald College where I worked as a post-doctoral fellow with Professor Buckland. It is almost seven years ago. My daughter, 11 years old then, especially loved Canada and has kept in touch with her many friends there. She is now 18 and is trying for an entrance examination into university this month.

I would like to read this wonderful magazine forever so as not to forget our time in Canada.

Noboru Fujihara, PhD
Assistant Professor
Department of Animal Science
Kyushu University
Fukuoka, Japan.

newsmakers

on campus

ROBERT BONNELL has joined the Department of Agricultural Engineering as a Professional Associate. He is working with Professor Robert Broughton as a Research and Development Engineer on projects in Canada and overseas. Robert has recently completed his MSc in Agricultural Engineering and he and his wife Arlene, BSc (FSc) '75, have settled in the Ste. Annes area.

PROFESSOR ROBERT S. BROUGHTON has been named "Distinguished Lecturer" by the North Atlantic Region of the American Society of Agricultural Engineers. He has given a lecture at the University of Guelph, at Macdonald, and will spend a day at each of three or four other North Atlantic Region Universities before the end of 1985.

PROFESSOR EDUARDO R. CHAVEZ, Department of Animal Science, visited El Salvador and Guatemala during March on a project development mission supported by the International Development Research Centre (IDRC). A cooperative project was prepared for the consideration of IDRC in the area of "Native Swine Production in Small Family Farms" to be conducted during the next three years. The institutions involved include: The Ministry of Agriculture of El Salvador, the Institute of Nutrition for Central America and Panama (INCAP) of Guatemala City and Macdonald College.

PROFESSOR BRUCE COULMAN of the Department of Plant Science is Secretary-Treasurer (1984-86) of the Canadian Society of Agronomy. This position includes being Newsletter Editor. He is also President (1984-86) of L'Atelier des cultivars et melanges of Le Comité des herbages, C.P.V.Q., the organization that coordinates forage testing in Quebec.

EMERITUS PROFESSOR RALPH ESTEY, of the Department of Plant

cience, delivered the keynote ddress of the Atlantic Universities Undergraduate Biologists Conference n the Nova Scotia Agriculture College n March. He was introduced to conerence members by Glen Sampson, Sc (Agr) '79, MSc (Agr) '83, while ruce Gray, MSc '80, took notes of the roceedings for local publicity. (Both re at present working on their PhDs t Macdonald.) Representative stuents and staff members from virtually very university in Atlantic Canada ttended the very successful three-day conference.

SUZANNA HUBLER, enrolled at Macdonald as a Visiting Student for the spring session, received a student exchange travel grant from the Associtation of the Faculties of Agriculture in Canada. Miss Hubler is a student in the Faculty of Agriculture at the University of Alberta.

DR. LIANG-CHERN LU has joined the Department of Animal Science as a Visiting Associate Professor from February 1985 through January 1986. Dr. Lu, who received his MSc (Agr) rom Macdonald in '65, is on sabbatic eave from the Department of Animal Science, Pingtung Institute of Agriculure, Pingtung, Taiwan. Dr. Lu will be articipating in research dealing with oultry management and eproduction.

off campus

VEGETABLE PRODUCTION IN TOGO

SERGE CHARRON, BSc (Agr) '84, is currently working in Togo, West Africa with CUSO as an extension horticulturist. His mandate for his two-year contract is to promote vegetable production (particularly during the dry season) in Togo's central region. This involves working with professional market gardeners and non-professional gardening groups that are producing vegetables to supplement their income or to raise funds for group activities or essential supplies such as medical kits. Serge provides technical information, organizational support, and encouragement and acts as a funnel for financial and material aid from a variety of sources. He has found the Togolese to be exceptionally warm and friendly, is enjoying his work, and is learning a great deal.

Serge comes from Senneterre in Abitibi and has a diploma degree from the Institut de Technologie Agricole in St. Hyacinthe as well as his bachelors from Macdonald. He has worked on many farms in Quebec and Australia and was co-founder and financial manager of a cooperative radio in his home town.

Sue Johnson, of Macdonald's Ecological Agriculture Projects, visited him over Christmas bringing a care package of spark plugs, inner tubes, socket wrenches, and a bottle of Calvados — essential items for the care and maintenance of motor cycle and driver. Sue travelled many kilometers visiting gardens and market gardens, and, as she has a special interest in fish raising, went to see several aquaculture projects set up by the Peace Corps. She hopes to see more tropical agriculture in the future and one day may apply for a CUSO posting herself.

erge Charron, left, is enthusiastic over the challenge to help improve vegetable production in Togo's entral region.

NEWS OF '84 GRADS IN THE MARITIMES

CAROL BOYD is a sales management trainee with Ralston Purina in the Annapolis Valley and South Shore to Yarmouth area of Nova Scotia. She expects to continue her training in Ontario. **ALEX CROUSE** has been working since last July on a 20-month project to develop hydroponic lettuce culture in a commercial greenhouse operation. This is a Nova Scotia-Canada Agriculture Food Development Agreement Project. **DANNY GILFOY** is 4-H representative for Cape Breton. **DANA PATTERSON** is a Shur Gain representative for Annapolis and Digby Countries. **SANDRA MacKINNON** is an acting 4-H representative for Halifax, Colchester, and Cumberland Counties.

ALISON DeFOREST PICKETT, BSc (Agr) '29, MSc (Agr) '36, DSc (McGill, Hon.) '59, was honoured at last year's Nova Scotia Agricultural College's Open House when a collection room was named in his honour: the A.D. Pickett Entomological Museum and Research Laboratory. Born in Lower Lars, New Brunswick, Dr. Pickett was provincial entomologist for N.S., from 1929 to 1939, spending the winters as a teacher of zoology and genetics at NSAC and the summers as extension entomologist. He was Officer-in-Charge of the Dominion Entomological Laboratory at Annapolis Royal in 1939 and was head of this unit when it moved to Kentville in 1950. He led the entomological research program there until 1962. At the time of his retirement

from the Canada Department of Agriculture in 1965 he was Senior Research Scientist. From 1965 to 1968 Dr. Pickett was head of the International Capsid Research Team located at the Cocoa Research Institute in Ghana. Dr. Pickett gained international recognition for his leadership in the integration of the biological and chemical control of pests of fruit trees in Nova Scotia and his work has promoted interest in insect ecology in many parts of the world. He and his wife now live at Deep Brook, N.S., where they operate a small fruit farm.

MORRIS SCHNITZER, BSc (Agr) '51, MSc (Agr) '52, PhD '55, who is the principal research scientist and program leader, soil nitrogen and organic matter, at Agriculture Canada's Chemistry and Biology Research Institute, recently received an award from the Soil Science Society of America.

JOE TUSKAMOTO, BSc (Agr) '54, MSc (Agr) '62, employed by the Manitoba Department of Agriculture at Brandon, recently completed a one-year term as President of the Canadian Society of Agronomy.

DR. R.I. HAMILTON, BSc (Agr) '57, of the Forage Section of the Ottawa Research Station, received the 1984 Agronomy Merit Award. It was awarded for "effective" research and extension efforts over 15 years which were instrumental in the re-establishment of corn as an important crop in the eastern prairies. The Award is presented annually to an agrologist and is sponsored by Western Co-op Fertilizers Ltd. in conjunction with the Alberta Wheat Pool, Saskatchewan Wheat Pool, and Manitoba Pool Elevators.

In response to our query for further information on his recent OFA appointment **DOUG AVERY,** BSc (Agr) '65, sent the following which we would like to share with you:

"In November the Ontario Federation of Agriculture's 120-member Board of Directors elected me to serve a one-year term on the OFA's Executive Committee. I am also the representative for the Leeds County Federation of Agriculture on the OFA's Board of Directors, a position I have held for the past four years.

"My wife Judy (BSc [HEc] '66) and I run a 200-acre fruit and vegetable farm. We have a market garden and a pick-your-own operation.

"My involvement with the OFA goes back 10 years. Recently, I have been involved and interested in farm labour, and I was Chairman of the Labour Committee for three years. One of the committee's chief concerns has been the need for improving health and safety in the farm work place.

"The work the OFA's executive committee does touches all elements of agriculture, from the need for a constant, affordable source of financing to the importance of well-equipped facilities for our agricultural colleges. The central activity of the federation is lobbying. We work hard at making the federal and provincial governments aware of the importance of the agricultural sector and the need to protect farmers' interests.

"The OFA represents 25,000 Ontario farm families and is generally acknowledged by governments, business, and the media to be the official mouthpiece for Ontario's farmers. I personally believe it is imperative for farmers in this day and age to become actively involved in forming the decisions which affect their well-being and their livelihood. The issues that affect our farms and our lives are much too important to be left to the bureaucrats and politicians whose knowledge of agriculture is often limited. It is this belief and the hope that I can help improve things for farmers that make me dedicate a great deal of my personal time and energy to the OFA."

CHARLES WARNER, BSc (Agr) '65, a nurseryman in Englehart, Ontario, has been reappointed for a two-year term to Ontario's Farm Tax Rebate Appeal Board. This Board rules on appeals from farmers who feel they have been unfairly denied rebates on their farm taxes. Six other farmers sit on the Appeal Board, and only farmers are asked to be on the Board because they are in the best position to understand the problems of those who appeal.

WAYNE CLARK, BSc (Agr) '67 of Brownsburg is the new Fieldperson for the Lachute branch of the Quebec Farmers' Association. Wayne, who replaced long-time Fieldperson Bill Dings, is a dairyman and, with some 6,500 taps, is also a well-known maple syrup producer.

The Ottawa Research Station has received support for three new alfalfa entries bred by **MOHAMED A.E. FARIS,** PhD '71. One of these entries is being released under the name "Olinda" and is the first Canadian bred alfalfa cultivar to possess bacterial wilt and phytophthora root rot resistance.

GABRIEL COMEAU, BSc (Agr) '75, is the first recipient of the C.A. Douglas Extension Award which was presented at the Nova Scotia Agricultural College Alumni banquet in July 1984. The award is in memory of the late C.A. Douglas and is presented to a person who is actively involved in agricultural extension work. Mr. Comeau, a native of Digby County, N.S., is an NSAC grad and is working for the N.S. Department of Agriculture and Marketing. The award will assist him in obtaining a Masters degree in Agricultural Economics from Cornell University.

DR. GEORGE ANSAH, MSc (Agr) '77, has joined the Shaver Poultry Breeding Farms Limited's Genetics Department and will concentrate on the brown egg pedigree programs.

JIM WERT, BSc (Agr) '79, a dairy farmer in Avonmore, Ontario, was recently elected President of the Junior Farmers' Association of Ontario during their 40th annual meeting in Toronto.

BONNIE O'CONNOR. BSc (Agr) '84, is assisting Dr. French, geneticist, at Shaver Poultry Breeding Farms Limited in Cambridge, Ont.

deceased

MARJORIE C. CRAVEN, Dip. P.E. '16 at Rawdon, Quebec, on January 29, 1985.

PHEBE J. McLEA PROWSE, Dip P.E. '24, BLS '46, at Guelph, Ontario, on February 5, 1985.

ERNEST L. EATON BSc (Agr) '25, at Windsor, Nova Scotia, on October 29, 1984.

LESLIE J. COOKE, BSA'26, of Arundel, Que., on April 2, 1985.

KEVIN ANGUS McDONELL, Dip, '82, at North Lancaster, Ontario, on January 31, 1985.

Renewable Resources students presenting the top third-year projects (and receving a Journal gift subscription from Professor G. Millette, see page 42) were, 1 to r, Lucille Brown, Aline Grenier, Sylvie Despatie, Anne-Marie Filion, seen here with Renewable Resources Chairman Professor Roger Titman. Absent from the photo is Moira Brown.

r. Jean David, Associate Dean, Public Relations nd Students' Affairs, presented Mrs. Marge Poirier f the Registrar's Office with a gift at the Scholas- ic Awards Banquet. Mrs. Poirier will be taking early etirement in August.

Third year Agricultural Engineering students and staff pose for photographs in between project presentations and iron ring ceremony.

Mac Woodsmen celebrated the 25th anniversary by having the men's A team take the overall championship. The B team placed th overall, and the girls' team took first out of all women's teams nd placed seventh overall, beating 12 men's teams!

Flanked by judges Keith MacDonald, left, of Ayer's Cliff, and Don Johnston from Martintown, Grand Champion Showman at this year's Livestock Show is Tim Béland, John Abbott CEGEP student from Waterloo. The trophy is being presented by Martha Robinson, last year's Grand Champion.

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